The Iron Age

A Review of the Hardware and Metal Trades.

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FOUNTAINS.

Ancient and Modern Styles of Fountains—How Fountains should be Set.

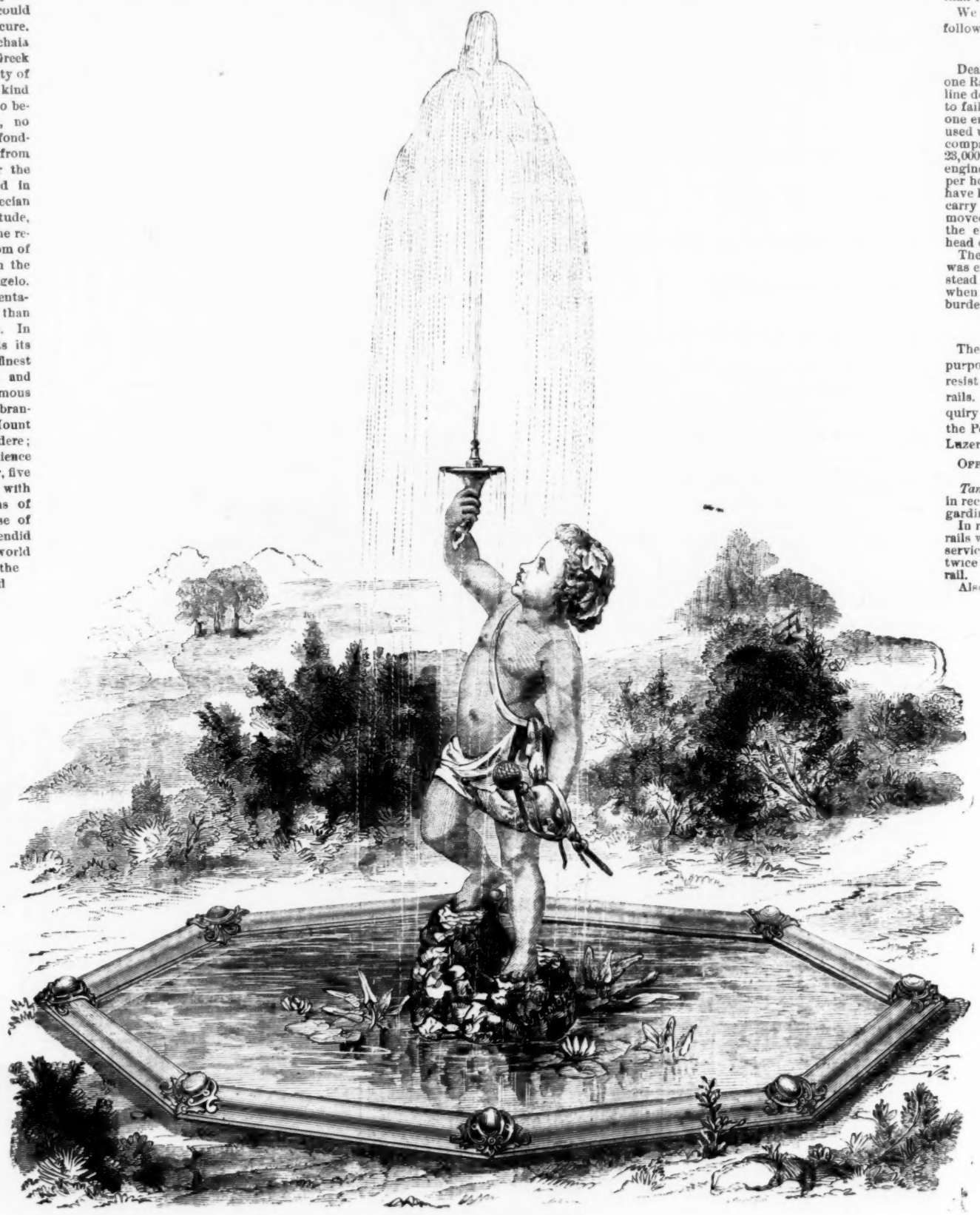
Fountains have ever been considered as among the most important and graceful embellishments of cities, parks and private pleasure grounds. The architects and sculptors of ancient Greece and Rome exhausted their skill upon works of this nature, the vestiges of which, where such exist, convey some idea of the beauty and grandeur of their conception. The display of water, moreover, was hightened by every device that the hydrodynamists of antiquity could invent and the most lavish outlay procure. The fountains of Corinth, Megara and Achaia are especially mentioned by ancient Greek authors for their magnificence and ingenuity of design; nor were public ornaments of this kind confined to large cities, since, if we are to believe the records of Grecian antiquity, no Grecian town was devoid of them. This fondness for fountains, transmitted to Italy from the sister peninsula, was fostered under the Roman Empire by works which rivalled in beauty the noblest productions of the Grecian genius, and far surpassed them in magnitude, and afterward, reviving in Europe with the resuscitation of art which followed the gloom of mediaeval barbarism, found expression in the wondrous productions of a Michael Angelo. The popular liking for this kind of ornamentation has since his day increased rather than diminished on the Continent of Europe. In Italy, more especially, every villa boasts its fountain, and in that country exist the finest models of this species of architectural and sculptural design. Among the most famous are those of St. Peter's, of the Villa Aldobrandini, at Frascati; of the Termini, at Mount Janiculum; of the Gardens of the Belvedere; of the Villa Borghese; that in the audience chamber of the Vatican, which is of silver, five Roman palms in hight, and ornamented with superb vases and flowers; the fountains of St. Paul, of the Acqua Acetosa, and those of Viterbo. But, perhaps, the two most splendid and varied fontanal exhibitions in the world are the exquisitely beautiful *jets d'eau* in the Orangery of the Palace of Versailles, and those of the Crystal Palace at Sydenham.

In this country we are only just beginning to appreciate the desirability of beautifying our public and private pleasure grounds with objects so graceful, refreshing and healthful, since nothing more effectually purifies the atmosphere than the spray of a fountain. Most of our large cities are admirably supplied with water, and yet the majority of them are nearly destitute of public fountains. New York, better off in this respect than some of her sister cities, is yet woefully deficient, considering her immense facilities for fontanal supply. A move in the right direction has, however, been begun by the erection of the graceful structure, cast in bronze, from the design of Miss Stebbins, the American sculptor, at the Central Park, and it is to be hoped that before many years our parks and squares will be able to boast many such works. In private grounds and parks the artificial fountain, so prominent and beautiful a feature in European landscape gardening, is still more rare. And this is not from any want of appreciation of its beauty, but because persons are deterred from availing themselves of such an embellishment by an exaggerated idea of the cost. Formerly, when marble and stone, terra-cotta and stucco, were the only materials used, and skilled artists were employed to cut or mold them into graceful shapes—a laborious and painful process—the expense was certainly great, and few except the very wealthy could afford such a luxury; but now that fountains are cast in iron, bronze and zinc, the expense is rendered comparatively trifling. The most beautiful works may be reproduced an infinite number of times for the simple cost of the metal used in casting them, and that, too, with a delicacy of outline and a smoothness which the chisel of the most expert sculptor and stone cutter in existence could never impart. Moreover, the most beautiful and delicate ornamental work in iron, if properly painted, will stand any amount of exposure without injury, while stone or terra-cotta and stucco are extremely apt to decay and crack from moisture and variations of temperature.

The accompanying illustration shows the perfection to which the art—for such it is—of casting iron fountains has been brought in this country. The great variety of designs and sizes adopted by our founders enables them to suit any taste, and to accommodate purchasers in the matter of price. The catalogues of our ornamental iron founders are always interesting and often beautiful, and the cheapness with which they can be sold will surprise those who are not familiar with the prices of such goods.

THE WATER SUPPLY OF FOUNTAINS.

Of course, space and the quantity of water available are the primal considerations which should govern the choice of size of the fountain. Where there is an unlimited supply of water, a great variety of effects may be produced, and the water itself should be principally relied on for display. A large quantity of water is not essential, however, the same kind of jets being made of different sizes. When the supply of water is not great, the lighter and more delicate style of fountain should be selected. The force of the jet depends upon the amount of fall of water between the source of supply and the fountain, the minimum for a proper jet being from 10 to 12 feet. By estimating the difference of level between the top of the brass jet and the surface of the water in the tank or reservoir the amount of fall is ascertained. If the head of water does not reach the above minimum, beautiful effects may yet be secured by fountains with tiers of basins, the water dripping from one to the other, and, by attaching large supply pipes, the appearance of a cascade may be produced. The nearer the fountain to its reservoir the better, as, if conveyed any considerable distance through pipes, its impetus is lessened by friction. When much length of piping has to be laid it should be either of large diameter for the whole distance, or, beginning with a large diameter, gradually diminish toward the fountain. By this means the force is retained at the jet and the loss through friction lessened. Where fountains are not supplied from public reservoirs, and water is obtained from a tank, one holding enough for two hours' consumption is large enough if the supply be uninterrupted. In case it is liable to interruption, the tank should be large enough to hold a reserve of water to keep the fountain in operation until the supply can be resumed. It is hardly necessary to say that the dimensions of the tank vary with the size of the fountain. Tanks are supplied by pumps worked by horse, pony or bull-lock-power, with water wheels, turbines, hydraulic rams, wind and steam engines. Where there is a running stream a small and inexpensive wheel will yield a good deal of power, and may be so arranged as to constitute a very pleasing adornment to a gentleman's grounds. A jet of considerable volume and hight may be secured by means of the hydraulic ram, when connected by pipes with a pond or reservoir, even when the fall of water is very moderate. Wind engines, which run night and day without requiring the slightest care, and the operation of which costs nothing, are admirably adapted for working pumps, and the power they supply may be used for driving chaff cutters and other agricultural machines. The little "steam pumps" which, with their boilers, occupy only a small space, are also very useful and economical contrivances for the raising of water. In a future article we shall give some practical information on the setting of fountains, the manner of laying and connecting the pipes, and the subsequent utilization of the water supply.



ORNAMENTAL IRON FOUNTAIN, BY THE MOTT IRON WORKS.

Puddle Steel Rails.

The first rail made from puddle steel in this country was, it is said, manufactured in Schuylkill county, Penn., under the Ralston process. The Pottsville *Miners' Journal* gives the following items of interest respecting the history of one of these rails:

The Reading Railroad Company laid down a rail capped with steel, made by this process, on their track in front of the rolling mill at Reading, in September, 1869. On inquiry as to the wear of this rail, the superintendent of rolling mill, Mr. Coxe, wrote, December, 1870, as follows:

The rail with a steel head made with steel furnished by you, was laid on our down track Sept. 18, 1869, and is wearing evenly and smoothly. W. E. C. Coxe, Supt. R. M.

On the 11th of November, 1871, he writes again:

Yours of the 19th to hand, inquiring about rail laid 9th month, 1869, and in answer can only repeat what I said before, that it is wearing evenly and smoothly.

In reply to a letter of inquiry, Mr. Coxe, under date of January 3, 1873, writes as follows:

Yours of 30th at hand. We have only one rail on our tracks made by the Ralston process, which as yet shows no defect.

We have some iron rails of our own manufacture which are doing equally as well, and both, after three years' wear, compare very favorably with the Bessemer rails, though ultimately, I think, the latter will show the greatest durability.

Yours, truly,
W. E. C. Coxe, Supt. Mill.

The rail is laid at a point where the wear and tear is very great and the usual manufacture of iron rails lasted but a short time. The great advantages which the Ralston steel rail have over the Bessemer is, that they are malleable, and can be reworked. The Bessemer rails last the longest, but cannot be rerolled, which is an important feature in the use of rails. The first cost of the Ralston steel rail is also less than that of the Bessemer steel rail.

We again wrote to Mr. Coxe and received the following answer:

PHILA. & READING R. R. Co.
READING, PA., March 21, 1874.

Dear Sir:—Your favor of 19th to hand. The one Ralston steel headed rail placed in our main line down track in October, 1869, commenced to fail late last year, by splitting on the head at one end, and may now be considered as about used up, although three-fourths of the rail is comparatively good. It has carried some 23,000,000 tons, exclusive of weight of cars and engines, at speeds varying from 10 to 40 miles per hour. This tonnage is large, although we have had iron rails of our own manufacture to carry 25,000,000 tons without failing, but removed from the tracks because worn down to the extent of one-fourth of an inch on the head or tread.

The material in the head of the Ralston rail was excellent, and had it been made solid, instead of by piling, would not have given out when it did, but would likely have borne the burden of at least another year.

Yours, truly,
W. E. C. Coxe, Supt. R. R.

These rails are now largely used for colliery purposes in this and adjoining counties, as they resist the effects of mine water better than iron rails. The following letter in reply to an inquiry was received from the superintendent of the Pennsylvania Coal Company's collieries in Luzerne county.

OFFICE OF GEN. SUPT. PENNA. COAL CO.,
DUNMORE, PA., March 10, 1874.

Tamaqua Rolling Mill Co.—Gentlemen: I am in receipt of yours of the 6th, with inquiries regarding steel rails received from you in 1870.

In reply will say that the ten tons of 20 lb. rails were put into mine, and it is doing good service from reports. I think it will do from twice to three times the service of the ordinary rail.

Also the 36 lb. rail laid upon main road is giving good satisfaction, but as the test is not so severe, we cannot say at this time how much more it will do than the ordinary rail.

Very truly, etc., JOHN B. SMITH.

Bismuth.

This metal occurs in its native state, and also in combination with sulphur, oxygen, silica and tellurium. The bismuth of commerce is almost exclusively obtained from the native metal, which is chiefly procured from the mines in Schneeberg, Saxony.

Commercial bismuth is never absolutely pure, but as the other metals with which it is associated are commonly more oxidizable than itself, it may, in a great degree, be separated from them by fusing the powdered alloy in an earthen crucible, with one-tenth part of its weight of nitrate of potash. When this mixture is heated until the nitrate is completely decomposed, a portion of the bismuth, together with the greater part of the impurities, will have been oxidized and remain in combination with the potash, while a button of purified bismuth collects in the bottom of the crucible.

Bismuth enters into the composition of the best type metal, and has the property of imparting to it a clean, sharp face. In the solder employed in the manufacture of pewter wares it also forms an ingredient, the composition being one part of bismuth, five of lead, and three of tin. Bismuth forms one of the ingredients of a fusible metal, from which, as toys, spoons are made which melt on being put into a cup of hot tea or water. An alloy composed of two parts tin, three lead, and five bismuth, melts at a temperature of 199° Fahrenheit. Another alloy has been used in some parts of the Continent of Europe in making safety plugs for steam boilers, which, by melting at a certain temperature, are intended to prevent their explosion. A subnitrate of bismuth is used as a cosmetic. Pearl powder is a similar preparation, obtained by dissolving bismuth in aqua regia, and precipitating by water. Bismuth is employed in the manufacture of porcelain, as an agent for fixing the gilding and for increasing the fusibility of fluxes, and neutralizing the colors which are often communicated by them. It is also used to some extent in medicine.

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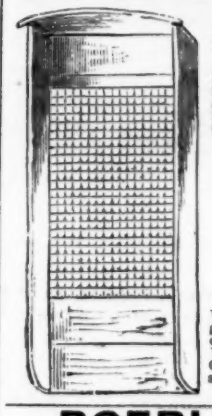

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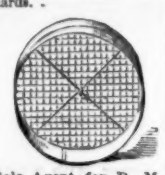

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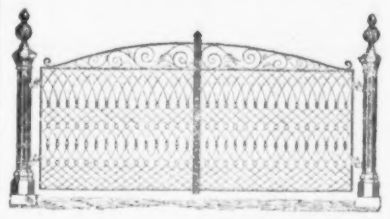

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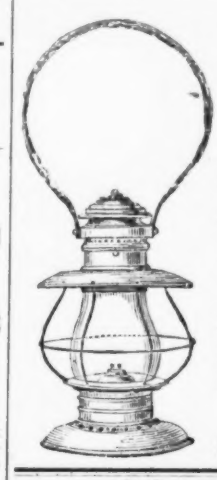

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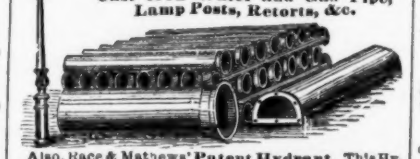

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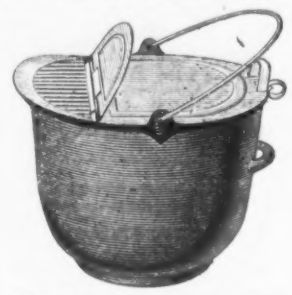
Improvement in Hollow Ware.

Messrs. Bodkin Bros., of No. 210 Water street, N. Y., have introduced an improvement in hollowware, which they call the Patent Safety Strainer Pot, and which seems to us so useful and so simple that it well merits a brief description.

The improvement consists—

First.—In the addition of a strainer formed upon the inner side of the vessel in such a way that the liquid contents may be poured off and the solid contents retained. This, it will be



seen, gives an entirely new usefulness to the vessel, without interfering with or diminishing its space or capacity.

Second.—The addition of a lip, by which the liquids can be poured off, and not be permitted to trickle down the side of the vessel, as has been the case with the one heretofore in use.

This vessel seems well adapted to the wants of the housekeeper, and in order to complete its safety and convenience a handle is attached to its rear side, so as to guide it when pouring

off its contents, thereby avoiding the possibility of scalding the person holding it; an accident which no amount of experience could provide against in the use of the older and more clumsy utensil.

In addition to these advantages a lid or cover is provided, so nicely adapted to its purpose that when pouring out its contents the hand and arm of the person holding it is entirely protected from the steam, which is only permitted to escape under the full control of the holder.

Messrs. Bodkin have also extended these improvements to other kitchen utensils of a similar kind, thereby increasing their utility and convenience.

Interesting Experiments with Bar Iron.

The officers of the Boiler Inspection and Insurance Company, of Hartford, Conn., have made some experiments with bar iron, which are interesting in themselves, and important as showing one cause of weakness in boilers which has hitherto escaped notice. We are indebted to Mr. John M. Allen, president of the company, for the following account of the experiments and their object:

When we wish to break a bar of iron, we usually cut a channel with a cold chisel around the entire bar at the point where the break is desired. This having been done we place the bar on an anvil with the channel slightly over its edge. A smart blow on the out lying portion will cause a fracture which at first sight has all the appearance of crystallization. Now if we take this same bar and cut a channel on one side, and subject it to the same treatment with the channeled face up, the crystalline appearance will show slightly, in close proximity to the bottom of the channel, but the main body of the bar will be bent and partly broken, displaying a fiber with a long silky appearance.

Now if we take this bar with no previous preparation and subject it to the same treatment, we shall find that, instead of breaking, it will simply bend to a right angle or more, showing no fracture whatever. The question arises why, with the same blow, do these different specimens of iron show such widely different results? It has been said that the blow on the cold chisel disturbed the fiber of the iron weakening it and putting it in condition to fracture at the point cut. Being desirous of demonstrating this matter, and for reasons given below, we obtained a bar of iron 1¼ inches wide and ⅝ inch thick. Instead of using a cold chisel we made use of a file and cut a channel around the entire bar. We then placed the bar on an anvil with the channel slightly over the edge, struck the out lying portion a smart blow and it flew from the bar like cast iron. The fracture presented a crystalline appearance. This experiment satisfied us that something other than the disturbance of the fiber by the cold chisel was the cause of this sudden disruption and consequent crystalline appearance.

Some have argued that when the original skin of the iron was broken or cut the strength was greatly reduced, and that fracture in bending was well nigh certain.

To settle this theory, we cut again a channel around the bar and put it upon a planer and planed away the surface for some distance each side of the channel until the channel was entirely "planed out." The bar was reduced in thickness nearly one-third, but the "original skin" of the iron was gone. We next subjected this to the same treatment as described above, and it bent beautifully with no indication of fracture. This demonstrated to our satisfaction that the "original skin" of the iron was not, in this kind of strain, what saved iron from fracture. It should be stated here that iron of good quality has been broken with an apparently crystalline fracture, where no chamfering or previous preparation had been made. See Kirkaldy's experiments on wrought iron and steel. But the circumstances were different from those under discussion here. When we bend a bar of iron slowly the fibers on the convex or outer surface of the bend are disturbed very greatly comparatively, and this distention or elongation of fiber decreases as approach is made to the other side of the bar, where a crumpling of the surface fiber will take place. From a careful examination of the bent portion, the different layers of fibers, so to speak, appear to have slipped or slid one over the other to an extent depending upon the degree of strain brought to bear upon each. Sections cut from the bent portion, when examined with a microscope, show, more or less distinctly, that the laminæ and iron threads have become disturbed and loosened in their cinder envelopes, particularly on the outer side of the bend. If the bending is repeated back and forth several times the loosening up of fiber is distinctly seen without the aid of a glass. Having briefly considered the action of iron fiber, in the process of bending, we return to the question of fracture. Why does the bar break suddenly and with a crystalline appearance under a smart blow at the point marked or channeled with a file? When a bar of iron is bent the outer fibers receive the strain first, breaking its severity as it is transmitted to those underlying. The disturbing force is distributed over the entire portion of the elongated fiber, diminishing each way from the point of greatest strain. Now it will be seen that by cutting a channel through the outer layer of fiber the strain is confined to the point where the channel is cut. The fiber on either side, to the depth of the channel, is not acted upon at all and exerts no influence as a protection to the underlying layers of fiber; hence, when the blow is received the effect is confined to the channel, the fiber having little or no opportunity to protect itself, and it breaks short off. When a channel was cut in the bar on both sides, and then planed out, the bar was virtually restored to its normal condition, and its behavior was the same as when in its original condition. Had we space allusion might be made to inferior qualities of iron, where in piling the center portions are very poor indeed, whilst the outside bars are of unexceptionally good quality. This kind of iron presents a good surface, but in bending and breaking its inferior quality is readily discovered. But the experiments which we made were with good bar iron. Now the object of these experiments was this: We not unfrequently find boilers fractured along the edge of the outer lap of the sheet, both transverse and longitudinal, and we further find a great many boilers where the caulking tools have been most carelessly used. It often occurs that the corner of the tool is allowed to cut a channel entirely through the skin of the iron, which renders the plates weak at the point often of greatest strain. The immense force in a boiler under pressure is little understood by those not familiar with the laws of steam, and when we take into consideration the fact that this immense pressure is striving to force the surrounding iron into a true cylindrical form, we shall gain some idea of the great strain brought to bear along the lap of the joints—the points deviating farthest from a true cylinder—and the importance of having the iron of the best quality and free from all defects by the careless use of caulking tools, or otherwise. The fractures found at joints, both longitudinal and transverse, are brought about by expansion and contraction, or by fretting of the iron from uneasy seating of the boiler in its setting, and it will be readily seen that any defect in the iron, at or near the point of greatest strain, is very liable to result in fracture. Boilers are sometimes met with that are at least one-third less capacity than they should be for the work required. The engine requires more steam than they can easily and steadily carry, hence, at every revolution, the draft is so great that the hand of the pressure gauge will vibrate through an arc, measuring a variation of from 10 to 15 pounds. The boiler feels the accumulating pressure, resulting from fires fiercely urged, and expands to its utmost to accommodate it, until the opening ports conduct the steam to the cylinder and afford it momentary relief. Thus the boiler like a great animal "breathes," and its "respirations" can sometimes be detected by the eye. With this slow but continuous process of bending back and forth, is it any mystery that boilers finally "give out?" And if instead of good, sound iron, there are defects at the points of greatest strain, need we look for mysterious agencies when boilers rupture—burst—or explode?

There are many little things that will work great mischief if they are neglected, and we believe the mystery will recede and vanish in connection with boiler explosions in proportion as sound and careful investigation is made. But patience and painstaking examination, extending over years if need be, are necessary to a satisfactory solution of this question, and the greater the number of boilers under examination, with their particular defects understood, the greater the fund of information from which to make up conclusions.

The Marquette *Mining Journal* says: A serious misfortune has befallen the Champion Furnace. At a quarter past eight o'clock Thursday morning a tuyere bursted, and in less than five minutes the entire concern was in flames. The engine house, hoist and stock house were completely destroyed, but the stack, hot blast, large engine and boilers were not very badly damaged. The large coal and wood piles near the furnace were saved only by hard, hot work. The iron roof and sides of the buildings checked the flames considerably, or the loss would have been much greater. We have not heard the loss to the company estimated as yet, but it must be quite heavy. The stack has been shoveled out, and is all right, the loss being mainly confined to the destruction of the buildings.

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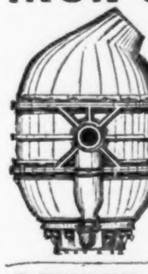

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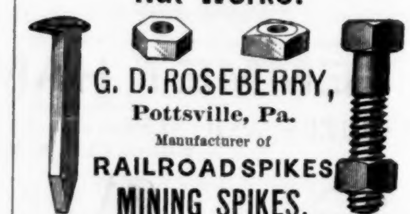

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New Patents.

We take from the records of the patent office at Washington the following specifications of certain patents lately issued, which will be found interesting:

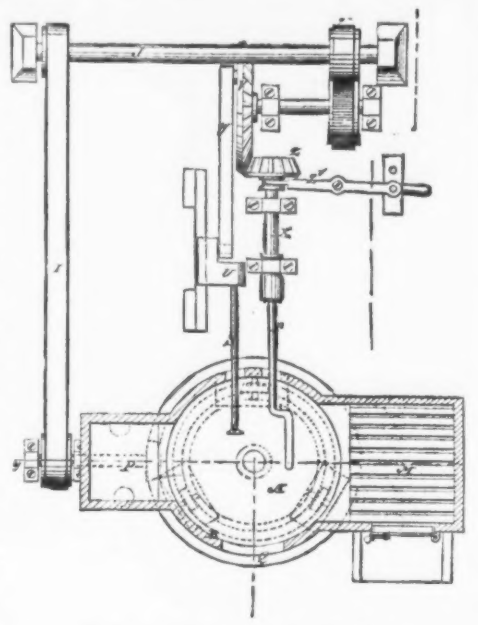
IMPROVEMENT IN APPARATUS FOR PUDDLING IRON.

Specification forming part of Letters Patent No. 148,112, dated March 3, 1874, issued to Joseph Davies, of Knoxville, Tennessee.

Figure 1 is partly a plain view and partly a horizontal section of my improved puddling furnace. Fig. 2 is a sectional elevation taken on the line *x x* of Fig. 1.

Similar letters of reference indicate corresponding parts.

A represents the puddling hearth, which is made in the form of a circular cup or tub, and arranged with its top fitted closely against the short cylindrical part B of the top C of the puddling furnace. This hearth is fitted on a pivot, D, at the center of its bottom, in a vertically adjustable step, E, and near the outer edge it rests on rollers F in stationary supports, so as to be revolved horizontally, for which it is provided with a toothed rim, G, with which a bevel pinion, gears, said pinion being driven by a belt from a driving shaft The step E screws up and down in the pedestal K, to regulate the pressure of the hearth top at its joint with the bottom B of the furnace top. Openings leading from the fire place M and to the chimney P are made through the sides of the station ary part of the furnaces. This portion has also a large opening, Q, for putting in and taking out the iron, and smaller holes R for the puddling tools S and T, which are worked by power apparatus to manipulate the iron as it is brought to them by the revolving hearth. The tool S is attached to a slide, U, and has a reciprocating motion imparted to it by the cranked wheel V and connecting rod W. The tool T has a rotary motion, which is imparted to it by the shaft X, to which it is attached, and said shaft is turned by a bevel pinion, Z, which gears with the cranked wheel V. Said pinion is arranged to shift out and in gear, and is provided with a shifting lever, Z^1, to shift it as required, for it is sometimes only needed to work the reciprocating puddling tool. The cranked wheel V is driven from the main driving shaft J by a belt, Z^2, and pulleys. By the rotation of the hearth in this way the puddling tools can be worked by power in a simple way, because the iron is brought to them by the hearth; and by using power driven tools the puddlers' labor is very much lessened.



IMPROVED PUDDLING APPARATUS.—*Fig.* 1.

Claim.—The combination, with a revolving furnace, of two puddling tools, S I, the one revolving and the other reciprocating therein, as described.

IMPROVEMENT IN COATING IRON AND STEEL.

Specification forming part of Letters Patent No. 148,795, dated March 17, 1874, issued to Enoch Wood, of Pittsburgh, Pa.

This invention consists of a new and improved composition for and method of coating iron and steel. The ingredients, with the proportions of each used in the composition with which the coating is accomplished, are as follows: Lead, or any of its compounds, six parts; borax, four parts; flake white, four parts; zinc, two parts; brass, two parts; copper, one-eighth; manganese, one eighth; tin, one-fourth; antimony, one-eighth; lime, indefinite.

Each of the foregoing named ingredients is taken separately and pulverized, after which they are melted together in such a manner as to secure their fusion at one and about the same time. The compound thus formed upon cooling, resolves itself into a disintegrated mass, which is afterward pulverized into a fine powder, and when in this condition is ready for use in the process of coating iron or steel.

A good compound, answering the purposes named, can be prepared from the above ingredients without fusing before use in the process of coating iron or steel. Its application must of necessity take place while the iron or steel to be coated is in a heated condition, a red heat being sufficient for the purpose.

For coating rolled iron or steel, the new alloy can be applied during the process of rolling, by means of any simple device for distributing it over the surface of the iron or steel, either during or before the operation of rolling. It can be equally well applied to ordinary iron or steel castings while in a condition of red head, by means of a metal brush, or other suitable device.

Immediately upon the application of the new alloy to the heated iron or steel, it fuses and spreads, which, upon cooling, forms a bright surface thereon. This new surface is perfectly impervious to rust or oxidation in any degree, under any and all conditions of exposure to weather or moisture. It also retains its color and its permanency up to a condition of red heat, at which point, however, its luster is temporarily lost, but its adhesiveness maintained. It is not claimed that bevond a condition of red heat its permanency could be secured.

Its application to sheet iron, especially when required for use in positions of exposure to weather, water, or moisture, is of the greatest importance, while bending even to breakage, does not cause the coating to scale off.

By the admixture of lead, zinc, brass, flake-white and borax in proper proportions, a surface of a darker shade is produced, while by the addition of manganese a still darker shade of coating is effected.

The coating in the case of rolled iron or steel, being done during the process of rolling, adds little to the cost thereof, while in the case of castings or forged iron, the process of coating being instantaneous renders it very economical.

Claim—1. A compound, composed of the following ingredients, in these or any other suitable proportions, namely: Lead, six parts; borax, four parts; flake-white, four parts; zinc, two parts; brass, two parts; copper, one-eighth; manganese, one-eighth; tin, one-fourth; antimony, one-eighth; and lime in sufficient quantity, either first pulverized and then mixed together, or first fused and pulverized, for use as a coating for iron and steel, to prevent rust and oxidation.

2. The method herein described of applying an unfused coating to the surface of iron and steel, while in a condition of red heat, by means of a metallic brush or switch, or by rolling.

IMPROVEMENT IN SEPARATING TIN FROM TIN SCRAP.

Specification forming part of Letters Patent No. 148,760, dated March 17, 1874, issued to Pierre de P. Ricketts, of New York.

This invention relates to certain improvements on the process for separating tin from iron in tinner's clippings, described in the Patent No. 128,265, granted to Thomas F. Wells, June 25, 1872.

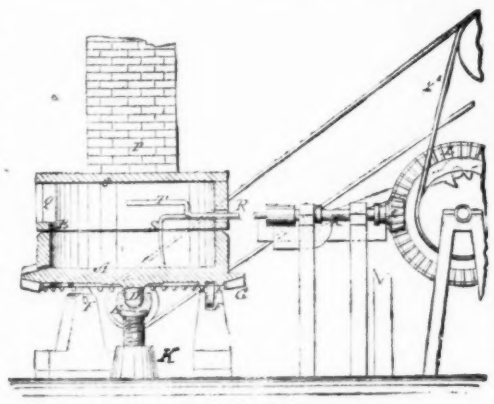


Fig. 2.

These improvements consist in treating the clippings or scraps, first, in a bath of hydrochloric acid, until about two-thirds of the tin has been dissolved, then immersing the same in a bath of hydrochloric acid, mixed with other acids, until the remainder of the tin is dissolved, so that from the first bath a comparatively pure tin and pure chloride of zinc are obtained, as hereinafter described, while the second bath yields an inferior product, consisting of tin mixed with iron. For the purpose of precipitating the tin from the solution the "dross" from galvanized iron and scrap galvanized iron is used, thereby effecting a saving in zinc, and increasing the yield of iron scraps.

In carrying out the invention, series of tanks or vats are provided, which are made acid proof, and which are filled, one with hydrochloric acid, the second with a mixture of hydrochloric acid, mixed with other acids—such as nitric acid, or sulphuric acid—a third with clean water, and so on. The scraps or clippings from which the tin is to be removed is collected in a suitable drum or basket, and immersed in the first bath of hydrochloric acid, until about two-thirds of the tin has been dissolved. The scraps are then removed from the first bath, and immersed the same in the second bath until the remainder of the tin is dissolved.

By following this course a pure chloride of tin, almost free from iron, is obtained in the first bath, which, when having been precipitated by means of zinc, gives a pure tin, the market value of which is much higher than that of tin contaminated with iron. Beside this, pure chloride of zinc is obtained which can be used with advantage for preserving wood.

The second bath, which contains nearly all the iron dissolved, will yield an impure tin; also, a material which will command a good price as a disinfectant.

For the purpose of precipitating the tin from the solution, dross from galvanizing iron and scrap galvanized iron is used in the same manner in which metallic zinc is commonly employed for this purpose; and, since the dross obtained in the process of galvanizing iron, and also scrap galvanized iron, are commonly considered and treated as mere waste, a saving of from four to six cents per pound is effected upon the zinc used; and, furthermore, a quantity of iron is obtained from the dross and from the scrap galvanized iron, which can be sold with the iron from the tin scrap.

The iron from the zinc will, of course, be in the bottom of the tank, after precipitation, with the metallic tin, and may be separated from the same by throwing it on a sieve.

From the foregoing description it will be seen that the principal aim of the improvements is to reduce the expense of the process for removing the tin from iron in tinners' clippings; and, since the practical success of such process depends wholly upon the question of profit or loss, the saving of a few cents renders the process a success, while other processes, by which tin can be easily removed from tinners' clippings are practically failures, because they do not pay.

Claim—1. The process of separating tin from iron in tinners' clippings, by immersing said clippings first in a bath of hydrochloric acid, until about two-thirds of the tin is dissolved, and then introducing said clippings in a second bath of hydrochloric acid mixed with other acids, such as nitric acid or sulphuric acid.

2. The process of precipitating tin from the solution by means of dross from galvanizing iron or scraps of galvanized iron.

A Favorable Locality for Iron Manufacture.

Mr. Henry Dedaker, of Allen's Creek, Amherst county, Virginia, sends us some interesting facts in relation to the iron ores of that neighborhood. He states that at Allen's Creek, which is situated in the valley of the James River, on the canal of that name, about 120 miles west of Richmond and 26 miles east of Lynchburg, there is one of the best natural locations for a furnace, or other machinery for the working of iron, that he has ever seen, iron ore (both magnetic and hematite) existing in the immediate vicinity in sufficient quantities to supply material for iron working operations on the most extended scale for a century to come. There are, also, at the precise point where they would be most serviceable, a never failing water-power and an abundance of limestone. Mr. Dedaker thinks that a furnace erected at Allen's Creek could, with a tramway about 400 yards in length conducting to its bridge house (on a level), be furnished with an ample supply of the very rich magnetic ore which follows the line of a mountain ridge, varying from 150 to 300 feet above water level, and crops out at different points for three miles. By means of a level tramway in another direction, and by tunneling through the ridge, as many as three distinct veins of ore might be intersected, all of good quality, and only about one-half or three-quarters of a mile from the furnace. Mr. Dedaker also says that there are inexhaustible quantities at other points up and down the canal. He adds, moreover, that he is not actuated by personal motives in communicating this information, for he does not own a foot of land in that vicinity, and has no ore to sell. We are happy, therefore, to give publicity to the above facts, coming, as we have reason to believe they do, from such an unbiased source.

Report of Inspections Made by the Hartford Steam Boiler Inspection and Insurance Company, for the Months of January and February, 1874.—The number of inspection visits made during these months was 2204. Number of boilers examined 4342; internal examination, 1298. The hydraulic pressure was applied in 289 cases, mostly in connection with new boilers, before leaving the yard of the boiler maker. The weaknesses and defects discovered in these examinations were 1988—353 of which were regarded as dangerous. We are not prepared to say that all of them would have resulted in immediate disaster, but they were in a condition where disaster was liable to occur at any moment. The conditions under which boilers are used have much to do with developing these defects. If a boiler is forced beyond its ability it is strained, weakened and fractured, and often rendered dangerous, even though its dangerous condition is not understood, and it finally fails with more or less destructive results. Number of boilers with defective furnaces, 94—14 dangerous. Fractures, 140—68 dangerous. Burned plates, 148—88 dangerous. These last defects more frequently occur from deficiency of water owing to defective feed apparatus or leaks. Blistered plates, 353—73 dangerous. Cases of deposit of sediment, 362—35 dangerous. External corrosion, 161—26 dangerous. This is a defect often met with. It is very insidious in its progress, but by care and attention can be arrested and prevented. If leaks are allowed to go unrepaired, corrosion must follow. Covering a boiler with brick work so that leaks cannot be detected is a dangerous practice. Allowing the joints of fittings to go unpacked when leaking is productive of difficulties and annoyances arising from corrosion. Internal corrosion, 54—8 dangeraus. Much might be said on this subject, but experiments in progress will sooner or later furnish material for a special article bearing upon the question of internal corrosion. Internal grooving, 16—5 dangerous. The cause of this defect was fully set forth in our last annual report, and subsequent investigation confirms fully our views there expressed. Water gauges defective, 92—17 useless. Blow off defective, 44—8 dangerous. Safety valves overloaded, 51—20 dangerous Pressure gauges defective, 285—32 dangerous. Boilers without gauges, 88. Cases of deficiency of water, 7. This defect arises from leaks, or defective feed apparatus, and is one of the principal causes of burned plates, defective furnaces and fractured plates. Braces and stays loose and broken, 76—23 dangerous. Boilers condemned as unfit for use, 24.

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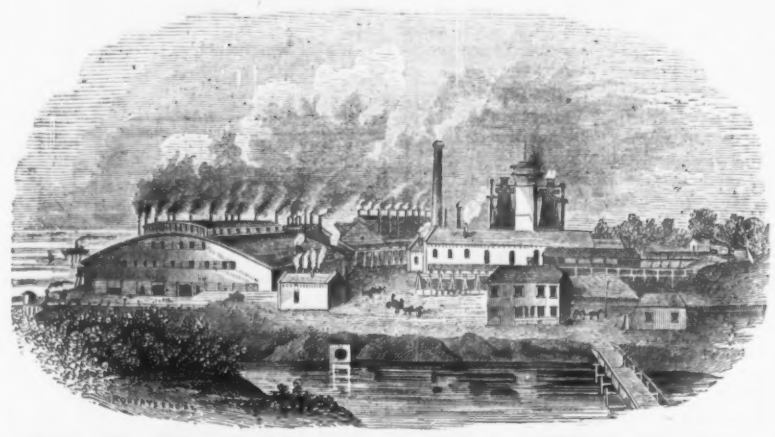

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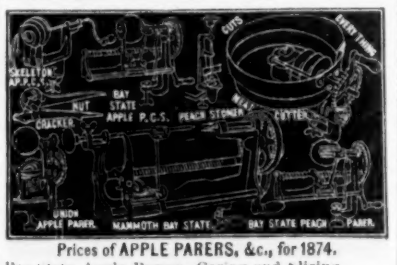

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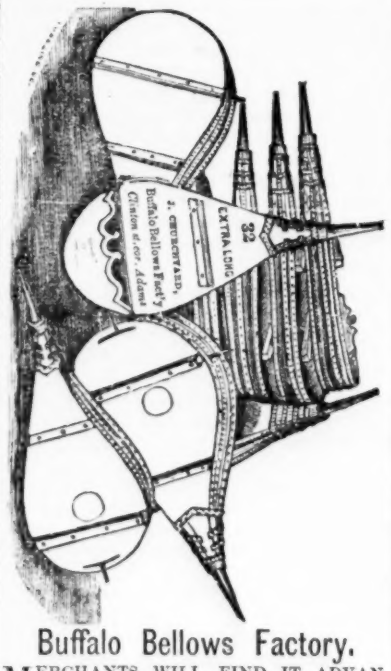

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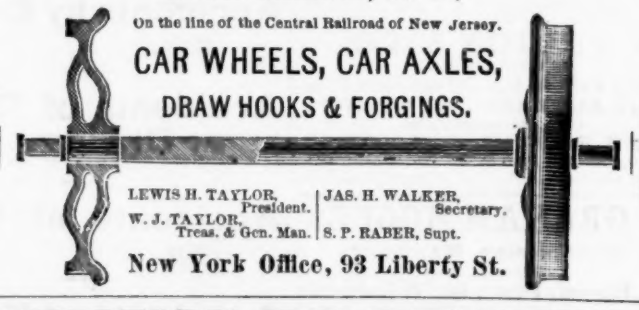

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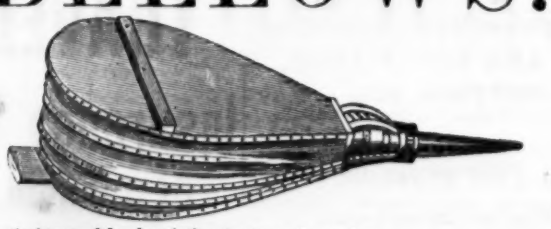

For further particulars send for descriptive circular and price list.

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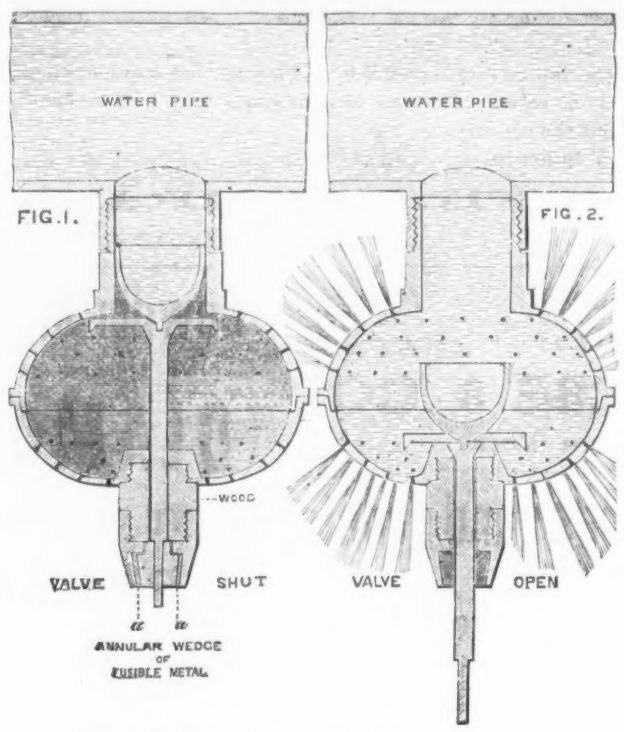
Automatic Flood Pipe for Buildings.

Mr. Stewart Harrison, of London, England, has invented an apparatus for automatically flooding buildings with water in case of fire, which is very clearly shown in the accompanying illustrations.

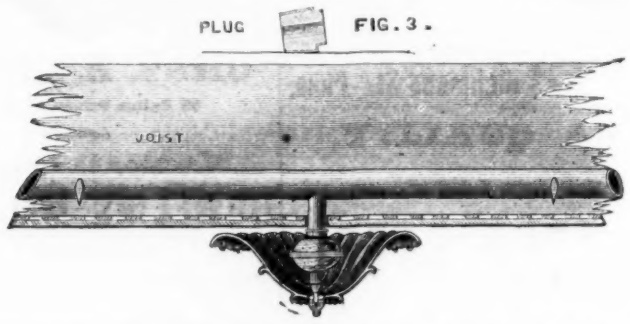
The self-acting preserver valve (Figs. 1 and 2) is so constructed that the valve is held in its seating, so as to prevent the efflux of water, only by a conical brass plug, carrying the stem or spindle of the valve, and retained in position within a suitable conical recess or seat by an annular wedge of fusible metal. Between the valve and the plug there is a perforated hollow spheroid, which acts like a rose, to distribute the water, when issuing under pressure, on all sides; and this rose and the plug beneath it necessarily project downward below the ceiling, for obvious reasons, the supply pipes being affixed by holdfasts to the joists above. Then, in case of a fire occurring by accident, generating flames and elevating the temperature, so soon as the boiling point of water is attained, the fusible plug melts, the plug drops out, the valve falls, and water in continuous streams is at once discharged upon the fire and flame, extinguishing them before they can spread or gather strength so as to become uncontrollable; in fact, the fire is the immediate agent and existing cause of its own destruction.



AUTOMATIC FLOOD PIPE FOR BUILDINGS.—(*Figs. 1 and 2.*)

So far it is clear there is nothing out of the way or impracticable in the scheme; nothing involving any departure from existing practice, as in the case of gas and water pipes, bell wires, speaking tubes, and the like; of which, indeed, it is the corollary and extension. But it obviously involves the absolute existence of a constant public water supply, at high pressure, accessible and available; or, in default thereof, of adequate storage of water in cisterns, of sufficient dimensions, suitably placed, to give the requisite supply and pressure. It is obvious, also, that some expedient in adaptation to the circumstances of a frost, by saline ingredients and due circulation, would be advantageous or necessary.

To avoid the danger of unduly flooding a building, and thus causing as much damage by water as would probably have resulted from fire, Mr. Harrison has produced an attachment which causes the water to depress a piston, which releases and sets in action an alarm; which, by making a connection with a galvanic battery, and completing a circuit, might, if required, be made to ring an alarm bell situated anywhere, these alarms continuing until attention is aroused, and some one comes to turn off the water and stop the flow, and the alarm simultaneously.



The Utilization of Waste Substances.

[Concluded.]

The minor uses of the numerous other components of the vegetable world are singularly varied. Rapeseed, linseed and cotton seed, after the oil has been pressed out of them, present the form of husky cakes, which, both in themselves and in the portion of oil which they still contain, are valuable as cattle food, for which they have very fattening qualities. It affords a curious instance of the discreditable adulterating practices of our day, that there are many factories in which the husks and refuse of rice are worked up into a substance called "shude," sold in thousands of tons, to adulterate oil cake, to which it is made to bear a considerable resemblance—wanting, however, in the oleaginous properties of the latter. Grape husks, when charred, are employed in making the intensely black ink with which bank notes are printed. The raisin stalks and skins which accumulate on the hands of British wine makers form the very best filter for the use of vinegar manufacturers; and hence arises a certain advantage in carrying on both those processes in one establishment, as is done by the celebrated firm of Beaufoy, at Vauxhall. Rice husks, and the delicate pellicle which incloses the grain, are largely employed as a litter for stables, as a substitute for saw dust, and as a food for live stock and poultry. The bran or refuse from the grinding and bolting of corn is useful as a food for cattle, as a material in tanning, as a cleanser in calico printing and tin plate making, and as a stuffing for cushions and dolls. Brewers' and distillers' grains are much sought after as fattening food for live stock. The bread raspings from rolls and from over-baked loaves are used as a coating for hams, and in some districts by poor persons as a substitute for coffee. In Paris, such of these raspings as have been carbonized to blackness are pounded, sifted, and sold as tooth powder. Beet-root fiber, after the root has had the juice pressed from it for sugar making, is eagerly bought by the Continental farmers as a fertilizer; while the skinnings from the boiling of the sugar are added to the food for cattle. This same sort of fiber will work up well with other substances as a material for paper, and for papier-mache tea trays, etc. The "trash" or fiber of the sugar cane, after the juice is expelled, is used by the West India planters as fuel; although chemists tell them that it still contains a great deal of valuable sugar, which might be more profitably applied. The molasses which is left as a residue in beet root sugar making can be distilled to yield a spirit, and then made to yield a useful amount of potash. Tan-pit refuse, a complex mixture, with much vegetable and little animal substance, is employed in hot-houses and forcing stoves, and also for making a peculiar kind of charcoal. Maize, in America, beside supplying an important article of food for man, is brought into requisition in a great variety of ways; the grain is made to yield a spirit and an oil, the stalk has sugar and molasses extracted from it, the cob is an acceptable food for cattle, and the husk is employed for packing oranges and cigars, for stuffing mattrasses, for making paper, and as a cheap substitute for horse hair. The cuttings of cork are used as a piston packing for steam engines, as a stuffing for beds and pillows, as a buoyant material for safety-boats and garments, and, when mixed with asphalt, as a road material for suspension bridges; the elegant new suspension bridge at Battersea Park furnishes an example of the last named kind. Rotten potatoes, damaged grain, and refuse rice, are sources whence excellent starch is obtained. Horse-chestnuts, which used to be valueless, except as an occasional food for sheep, are now ground, mixed with a little carbonate of soda, to neutralize the bitter principle, washed to whiteness, and employed in making meal, starch, vermicelli, and macaroni. The brick tea, made from the spiked leaves and stalks of the tea plant, is a cheap and potable substitute for regular tea; but the lie tea, made from the refuse of the tea plantations, and from the sweepings of the Hong storehouses at Canton, is too often sold as an unfair adulterant. Acorns are roasted and ground for coffee in France. Malt "commings," the refuse of the kiln, is one of the too numerous adulterants of coffee, while, as a more honest application, it is a valuable manure. Pea-shells are carried in van-loads from Covent Garden Market to the dairies in the vicinity of the metropolis, as a food for milch cows; in France, they are made to yield a little spirit by distillation, and are used, also, in paper-making. Sawdust and shavings have a multiplicity of useful applications; from mahogany, they are used in smoking fish; from boxwood, in cleaning jewelry; from cedar, in making "otto of cedar-wood;" from sandal-wood, in filling scent bags; from deal, in packing bottles and ice, in stuffing dolls, cleansing metals, and sprinkling floors. Tobacco ashes, procured by burning damaged tobacco in the custom-house kiln or "Queen's Tobacco-pipe" at the London docks, are sold to tooth-powder makers. In Savoy, walnuts are pressed for walnut oil; and the residue oil cake is eaten by children and poor persons. Palm oil, which is shipped to the extent of fifty thousand tons annually from the west cost of Africa, for the manufacture of soap and candles, is made from a pellicle which surrounds the nut or kernel; this kernel used to be thrown away as a useless residue; but another kind of oil is now expressed from it. It has been estimated that there must be ten million bushels of nuts to yield the fifty thousand tons of palm oil; that the kernels from this enormous quantity ought to yield the more delicate oil—something like cocoa-nut oil—to the value of three million pounds annually; and that there would remain one hundred and twelve thousand tons of oil cake, worth five hundred thousand pounds, as cattle food.

Turn we finally to the mineral kingdom, which presents its own peculiar list of "waste" or refuse now applied to useful purposes. The screenings and siftings at our coal-pits, once allowed to remain valueless, are now become a marketable commodity, either by themselves, or mixed with other substances to form artificial fuel. At the gas works, after the gas and the coke have been made from coal, there are many residual substances which, in the early history of the manufacture, were regarded as troublesome incumberances; but now they nearly all become useful. From the liquid left in some of the pipes are manufactured sulphate of ammonia for manure, sal-ammoniac for soldering and for calico printing, ammonia for dyers, and as one component in orchil and cudbear. A kind of oil useful as manure is obtained from the shale of the coal. Coal-tar (of which three hundred thousand tons are among the annual residue of our gas works) is used in the preparation of printers' ink, lamp black, asphaltic composition for pavements, disinfectants, artificial fuel, and for yielding a magnificent straw-color dye for silk. There were days when naphtha, now used for artificial illumination, benzole, now used as a lubricator, and paraffine, now used for a variety of purposes, were all thrown away as waste. Ashes and small cinders form a well known ingredient in bricks; and soot is worth sixpence per bushel as manure, even if chemists make no use of it for the charcoal it contains. Argol, the sediment of wine casks, is imported to the extent of a thousand tons yearly; when purified into "cream of tartar," it is used as a medicine, and also as a mordant by dyers. One thousand tons of broken bottles, instead of being thrown away, are, in London alone, yearly consigned to the glass furnace, to commence a new career of usefulness. Horse-shoe nails, picked up by the grubbers about the streets, and the scraps of steel from needle factories, are eagerly bought up by the Birmingham gun makers, as the best of all material for the barrels of muskets and rifles. Steel-pen waste is bought back by the Sheffield steel makers at ten pounds per ton; Birmingham brass filings fetch half the value of new brass; and steel filings are valuable to chemists and apothecaries. Jewelers, and gold beaters' sweepings are rated at a very high value; the sweepings of the benches and floors are always preserved for sale; the clothing and aprons have a sufficient number of particles of gold in and about them to give them a marketable value; the older they are, of course, the better. A gold beater can generally obtain a new waist-coat for an old one; and sometimes a very old waistcoat will be bought by a refiner at a price almost fabulous. In all such cases, everything extraneous is burnt away, leaving precious gold as a residue. Tin plate cuttings, in hundreds of tons, are awaiting the result of experiments now being made to separate the tin from the iron, and thus render both again serviceable; meanwhile, the scraps are applied to a few useful purposes. The old iron shops, which are supplied by dustmen, street-grubbers, mud-larks, and other persons, in their turn supply the captains of American ships with battered and broken old kettles, saucepans, frying-pans, gridirons, candlesticks, tea-trays, shovels, boilers, corrugated roofing, etc. These odds and ends serve as a cheap kind of ballast for ships going away with light cargoes.

Enough. Readers of any experience could easily add to this curious list of proofs that nothing is valueless—that there is good in everything.

Metallic Floors.—A method has been devised for rendering floors in a good degree fireproof, by employing long, flat bars of thin sheet metal, with a perpendicular flange turned on each edge. Other long, thin bars, which are curved or arched, and riveted at or near their edges to the first named strips, are placed edgewise vertically, one between each two, the connection being so arranged that the tops of the arches do not rise quite as high as the tops of the first set of bars. Narrower strips are also arranged across and riveted to the lower flanges at suitable intervals apart, to serve as lathe for holding the ceiling plaster to be applied to them, as well as to brace them laterally. Similar strips are arranged across and riveted to the upper flanges, or wood pieces may be bolted on to receive and support the floor boards. The outside flanges are built into and rest in the wall; and other flanges may be applied, if desired, to the outside strip for letting into the wall. For a floor of great length the bars are lapped and riveted.

THE NICHOLSON FILE.

All Nicholson Files are cut with the Patent *Increment Cut*, an invention owned and controled exclusively by us, the file cut in this manner being Patented as a new article of manufacture, and differs from all other machine cut files (all of which have their teeth cut with equal spaces) by being cut with teeth slightly *expanding or increasing in size and space from the point*, thus avoiding the too great regularity of teeth common to all other machine cut files. The tendency of all cutting tools with teeth or cutters placed at regular distances from each other may be illustrated (to the machinist at least) by the fluted reamer—as it is well known that if a round reamer be made with (say 12) teeth whose spaces are equidistant, the hole reamed will *not* be round and smooth, but will approximate to a hexagon in shape. Whereas, if the same number of teeth be made of irregular distances, the hole reamed will be both round and smooth. The same is true of a file, hence the necessity of its having teeth at unequal distances, and to which we have applied the name of Increment Cut File, which possesses all the advantages of hand cut work, and the accuracy and uniformityof machine work. It is now upwards of seven years since this File was introduced to the public, and the demand has increased until our production is undoubtedly treble that of any File manufactory in the country.

We put all files under seven inches in boxes of either one-half or one dozen each. These boxes are neatly arranged, and open on the end, on which the kind is plainly marked with printed labels, acknowledged improvements on the old methods.

The "*Increment File*" is not an experiment, but an established fact, and already has acquired a legitimate demand for upwards of 500 dozen per day. We employ no *regular Travelers*, but our goods may now be found in the hands of the principal jobbers and dealers throughout the country.

Prices and terms will be forwarded on application to

NICHOLSON FILE COMPANY,
Providence, R. I.

HURD'S HURD'S

HURD'S RAZOR BLADE AXES
MANUFACTURED FROM THE BEST ENGLISH EXTRA CAST STEEL BY THE JOHNSONVILLE AXE MFG. CO.

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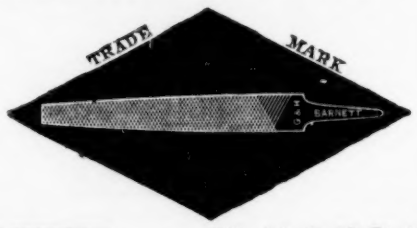
IMPORTERS OF

Stubs' Steel Wire, Files and Tools,

Grobet Swiss Files,
Extra Quality English Spring Steel Wire,
Nos. 1 to 34.
Steel Wire for Sewing Machine Needles and for other Purposes,
French Cold Rolled Sheet Steel,
Sizes, 22 to 36 Gauge.
Jewelers', Engravers' & Mechanics' Tools.
The only Agents in the United States for
HUBERT'S CELEBRATED FRENCH EMERY PAPER.
For Hatters' and Machinists' Use.

Black Diamond File Works

Send for Illustrated Price List.



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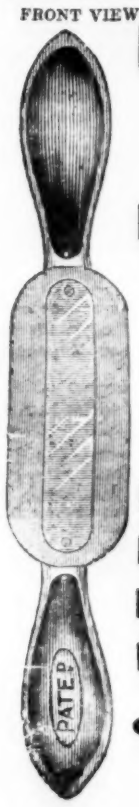
G. & H. BARNETT. 39 41 & 43 Richmond St. Phila.

FILES AND RASPS.

XTRA QUALITY,
MADE FROM THE BEST
IMPORTED STEEL,
BY THE
Auburn File Works,
AUBURN, N. Y.

FRONT VIEW.



BACK VIEW

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WHOLESALE

HARDWARE HOUSE,

AND

HARDWARE FACTORS.

BATES' MANUFACTURING CO.'S GOODS.

Bonney's Pat. Hollow Augers & Spoke Trimmers.
Bonney's Patent Double-Edged Spoke Shave.
Bonney's Patent Adjustable Gate Hinge.
Bonney's Patent Sash-Fast and Lamp Bracket.

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Cowdin Mfg. Co.,

Manufacturers of the

DIAMOND FLINT AND EMERY PAPER,

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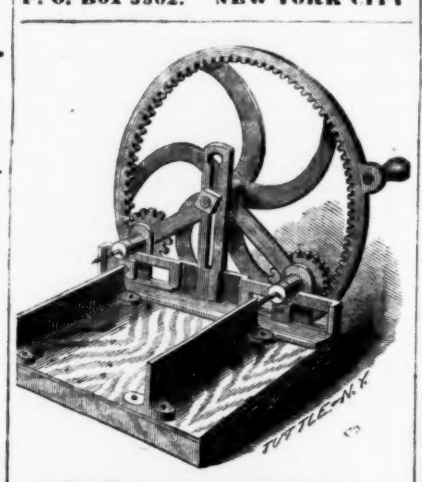

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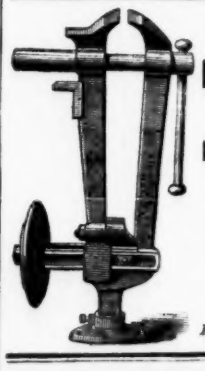
Merchant's Improved
DOWELING MACHINES,
FOR COOPERS' USE.
Price List mailed on application.



Patent Parallel
Machinist's Vise
Manufactured by
Harrisburg Foundry and Machine Company,
Harrisburg, Pa.

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CAIN, GORDON & CO.,
Union Chain & Anchor Works,
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American Chain Cable Works,
28 Years' Experience in the Business.
KENDRICK & RUNKLE, Trenton, N. J.
Manufacturers of **Cable, Crane, Coal Mine Slope, Car Brake Chains, Traces, Breast, Binding, Cow and Log Chains** of all kinds.
N. B.—The highest grades of Crane Chains a specialty.

New England Chain Works
771 Eddy Street, Providence, R. I.
Manufacture **Iron Chain** of every description.
Mowing Machine, Crane, Break, Draft Chains, &c., &c.
Also, Latest Improved Cotton Can Rings.
THOS. WYATT, Proprietor.

PENNSYLVANIA FILE WORKS.

TRADE  MARK

McCAFFREY & BROTHER.
Manufacturers of FIRST QUALITY FILES and RASPS ONLY,
Nos. 1732 & 1734 North Fourth Street, Philadelphia, Pa.

Coopers' & Turpentine Tools.

Coopers' Drawing Knives,
Coopers' Adzes and Axes,
Coopers' Froes,
Stocked Croze and Irons,
Coopers' Jointers,
Trass Hoops, all sizes.
Turpentine Hackers,
Turpentine Shavers,
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N. WEED, 37 Chambers St., N. Y.

FERNALD & SISE,

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HARDWARE MANUFACTURERS' AGENTS,
REPRESENT:

Reading Hardware Co.
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Hardware and Upholsterers' Brass Goods,

SOLE AGENTS FOR

L. L. Davis' Patent Levels, Stevens' Calipers and Dividers,
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Manufacturers of Judds', Prindle's and Combination Patent Curtain Fixtures, Locks and Curtis Patent Raisin Seeder, Patent Twine Boxes, Picture Nails and Hooks, Escutcheon Pins, Coat and Hat Hooks; also Miscellaneous Iron and Brass Goods.

Small Brass and Iron Castings made to order.
64 Duane Street, NEW YORK.

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AGENTS FOR:

William Penn, Reading and Norristown Pig Iron.
Reading Iron Co.'s (Crescent Brand) Nails, Boiler Flues, &c.
Bar Iron, Plow Steel and Iron, South Easton Iron Wire.
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MANUFACTURERS OF AMERICAN HARDWARE.

Coes & Taft's Pat. Wrenches.
Axe, Pick, Sledge & Hammer Handles.
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Cast Iron Hatchets
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Pear Steel Spoons
Stocks and Dies.

EAGLE IRON FOUNDRY.

BUSINESS ITEMS.

PENNSYLVANIA.

Messrs. Anderson, Maxwell & Porter have extensive engine and boiler works at Allegheny City. They employ 75 hands, and have a large machine shop, foundry and boiler yard, being thus prepared to build locomotive and stationary engines and portable and stationary boilers.

The Titusville *Courier*, of the 8th, says: There is a rumor that the Pennsylvania Railroad has bought out the iron works of Brown & Struthers, and are to move their shops, etc., from Kane to Warren. If the rumor is correct it will be a good thing for Warren and vicinity.

It is stated that the Logan Steel Works, at Lewistown, are about to try the experiment of manufacturing a steel gun 18 feet long, and to weigh 40 tons.

The Lebanon Manufacturing Company have received orders to furnish the New York Central and Hudson River Railroad Companies 100 box cars, two 60 horse-power engines, one 35 horse-power engine, and six portable engines of eight horse-power each.

A new Siemens furnace is now being built by the Pittsburgh Steel Casting Company, to be used in making heavy castings. So great has been the demand for this class of manufactures that the company are obliged to increase their facilities in order to meet it. They expect to have the new furnace completed by the 10th of May, after which time they will be better prepared to fill orders.

The National Locomotive Works, situated at Connellsville, on the Pittsburgh, Washington and Baltimore Railroad, are running full time with their usual force of men. They have recently shipped quite a number of locomotives for roads in Colorado, Utah, Missouri, Iowa and South America. Their engines in Utah are doing service on roads of a grade of 326 feet to the mile. They make a specialty of engines for narrow gauge railroads and for mining purposes. Their location is peculiarly favorable for obtaining labor and material cheaply.

There is a likelihood that another furnace will be erected by Messrs. Kloman & Carnegie Brothers, at Pittsburgh, to be located alongside the Lucy. It is proposed to have it 24 feet at the boshes, which would make it the largest in the country.

The puddlers around Harrisburg, after a strike of four months over a reduction of wages from $6 to $5, have gone to work at the latter rate, and agreed to abandon the union.

MASSACHUSETTS.

J. S. Barden has begun the manufacture of his patent glass cylinder enamelled pumps at New Bedford, and has also completed arrangements for enameling pipe. A stock company will soon be organized to carry on the business, under the name of the Hydraulic Company, New Bedford, Mass.

The prospects of the machinists in Fitchburg are brighter. The Haskins Machine Company lately shipped six steam engines from their works, one of which goes to Glasgow, Scotland. The Fitchburg Machine Company have received several orders recently, and are now running on full time, with about 20 more men than they have employed of late.

The Boston and Lowell Railroad began, last Thursday, weighing at Framingham the cars from the West loaded with grain and lumber destined for Lowell and Taunton, and found an excess of 15,000 pounds in one car over the weight billed, of 20,000 pounds, a full car load, which makes a difference of $77 in freight. The above was a Fairbanks 50-ton 34 ft. track scale, sold to Boston and Albany R. R. Co.—*Boston paper.*

CONNECTICUT.

The "T. C. Richards Hardware Manufacturing Company," which has been located for the last eleven years in New York, and manufactures brass and iron small goods, have bought the water privilege and property situated on the outlet of the lake at Winsted for $12,500. They propose at once to put up a new three story building, 125 feet long, and will employ from 80 to 100 hands. The capital stock of this company is $60,000.

The Naugatuck Machine Co. have enlarged their shop, which has very much increased their facilities for work.

The monthly pay roll of the Ætna Cutlery Works, at New Britain, lately destroyed by fire, amounted to $30,000, upward of 500 men being employed. The owners, Landers, Frary & Clark, employed between 100 and 200 men and several teams in removing the ruins of their destroyed works, and reported that they would commence rebuilding in three weeks. Then the capitalists of Bridgeport began bidding strongly for Landers, Frary & Clark to locate in that city, agreeing to form a company with one million dollars capital; and, furthermore, to give, out and out, desirable ground, with a water frontage of 1000 feet. The prospect for the removal is said to be decidedly promising. All the officers of the company favor this change, but most of the stockholders are residents of Hartford, and wish that city to secure the location of the works.

NEW JERSEY.

The Grant Locomotive Works, Paterson, have received an order for 65 anthracite coal burning engines for a railroad in Russia. Of these 22 engines are of the ordinary American pattern, with 17x24 cylinders and 5½ ft. driving wheels; 43 of them will have 8 wheels coupled. The cylinders of the latter will be 20x24 inches and the wheels 4 feet in diameter. The fire boxes are to be 9 feet long, with water grates and iron flues.

MISSOURI.

There are six large establishments in St. Louis devoted to the manufacture of stoves. The aggregate capital is $1,500,000, and the annual production 115,000 stoves. These works give employment to 1150 hands, and the products are shipped to the South and West, and even to New Zealand and the provinces of South America.

The Bessemer Steel Manufacturing Company, at St. Louis, will, when completed, be a very extensive affair. The capital of the company is $1,000,000. The works are located on the river bank, directly opposite Carondelet, and the property embraces 100 acres of land, with a frontage on the river of 1197 feet. There will be two blast furnaces, each 60 feet in hight, 17 feet at boshes and 13 feet tunnel head. The East St. Louis & Carondelet Railroad runs through the property, also a narrow gauge road to Cairo and Big Muddy Rivers. The works are expected to be in operation early in 1875, and will employ 250 hands.

A new charcoal furnace is nearly completed at Warsaw, and considerable iron will be taken out this season in that vicinity.

The Pioneer Mining and Smelting Company, of St. Louis, was established in 1861, with a capital of $500,000. Last year the company erected new dressing rooms and opened two new mines. A large amount of labor has been expended, as the property, as a mining property, was new, on the construction of the works and opening of the mines. The Jupiter Furnace has just been completed, and consists of one blast furnace, 20 feet bosh, which is claimed to be one of the largest west of Pittsburgh. This company have a capital of $500,000, and employ 400 hands. Their annual product is expected to reach 30,000 tons.

The Missouri Furnace, at St. Louis, has a capital of $500,000. It was established in 1868, and gives employment to 175 workmen. The company annually produce 10,000 tons. Iron is now largely manufactured into steel and shipped as far East as New York. The company use largely the rich ores of Southwestern Missouri in their furnaces. The South St. Louis company have an authorized capital of $500,000, $383,000 of which has already been paid in. They have been organized since 1869, and produce yearly some 9300 tons. The works employ 150 hands.

MICHIGAN.

The two stacks of the Bay Iron Company, at Onota, are out of blast, having used up the stock of ore laid in. They will be repaired and altered somewhat before they are again put in operation.

The Northern furnace, at Chocolay, has been completely remodeled, and will soon go into operation. This furnace was built in 1860, but has been out of blast since 1867. Its diameter at boshes has been increased from nine to thirteen and one-half feet, and the hight from forty-three feet to fifty feet.

ILLINOIS.

A large variety of plows, embracing thirty-two different styles, are manufactured by the Weir Plow Company, of Monmouth, beside cultivators and other agricultural implements. The productions of the company amount to about $500,000 annually, and their manufactures are shipped South and West.

INDIANA.

The Perkins Engine Company, Fort Wayne, was incorporated on the 4th ult., the capital stock being $20,000. The company will manufacture the Perkins engine, which has already attained a wide celebrity. The works will be under the superintendence of Mr. P. B. Perkins. The company expect to turn out from twelve to fifteen engines per month.

Shipbuilding in the Fifteenth Century.

The following letter, written by John Alcetre to King Henry V., in 1419, is of peculiar interest. It is printed from the MS. copy in the British Museum in the first volume of the second series of Ellis's "Original Letters," and, as the editor describes it, "details minutely the progress of certain workmen at Bayonne in constructing a vessel of considerable size, which the king had ordered to be built. Bayonne was then the last town in the Duchy of Aquitaine. The Mayor and Corporation had contracted with the king for the completion of this vessel within a certain time, but the writer of the letter thinks it could not be ready, and that it would take even four or five years to finish. The ship, as the timbers had been laid down, was a hundred and eighty-six feet in length. The letter, which is also curious as illustrative of English orthography at that time, is as follows:

Most excellent, most hiest, myghtiest Prince and most Soverayne Lord, all manner of low sujjection afore sayde. Lykyth yt to youre royall Majeste to wete the governance and the makyng of youre shippe at Bayon. At the makyng of this letter yt was in this estate, that ys to wetyng xxxvij. strakys [stretchers] in hyth & bordyd, on the weche strakys hyth y lade xj. bemys; the mast beme ys yn leynthe xxxix fete, and the beme of the hameron by hinde is in leynthe xxxiij. feet; fro the one-most ende of the stemme into the poste by hynd ys in leynthe a hondred iiij. xx. and vj. fete; and the stemme ys in hithe iiij. xx. and xvj. fete; and the post xlviij. fete, and the kele ys in leynthe a hondred and xij. fete; but he is y rotyt [rotted] and must be changed.

Also lykyth yt to youre royall Mageste to wete that youre shippe wolle nat be redy at the terme that they have by hote [promised] you; and by that y can se nat this iiij. or v. yeres hereaftyr. For the Mayre and his consortes havyth y rendyd youre size [assize] iiijd. of the lb. at youre great dampnage [damage or loss] and hare [their] profyte: for yt is worth iij. [thrice] so muche as they peyth. Therefore, like as y have wrete to youre royall Mageste hereafore, for and all the money that comyth of youre syze schold go to the shippes workys, your shippe wold be sone a redy, and git of that litill somme that youre syze ys, y rendyd, fore they takyth thereof to thare owne use. And in this degre youre workys of youre shippe now nat gon forthe, and by eny thyng that y can see they wolle lefe of the makyng of youre shippe in short tyme, but yf ye make othyr ordynance thereto.

Also lyketh yt to youre royall Mageste to wete that they mow wat excuse hum [them] by Bord ne Tymbyr, for they mow have y now [enough] in the Countrey, as gode as any may be; and as touchying tr Carpenters they mow have y now yf they wolde, but they lenten hum go where they wullyth.

Also lyketh yt to your royall Mageste to wete that y mote nat know of no costages [costs] ne dispensys [expenditure], ne y what maner youre money ys by sette [best], but y lyke as hum selfen [themselves] list. And levying all myne occupacyons besy me, and travayle me aboute the makyng of youre Shippes.

Most excellent, most hiest, mightiest Prince and Most Soverayne Lord, Almyghty Jhesus have you in his kepying.

Wrete at Bayon the xxv. day of Averell [April.]

By youre pore subjecte and trew lege man

JOHN ALCETRE.

H. W. PEACE,

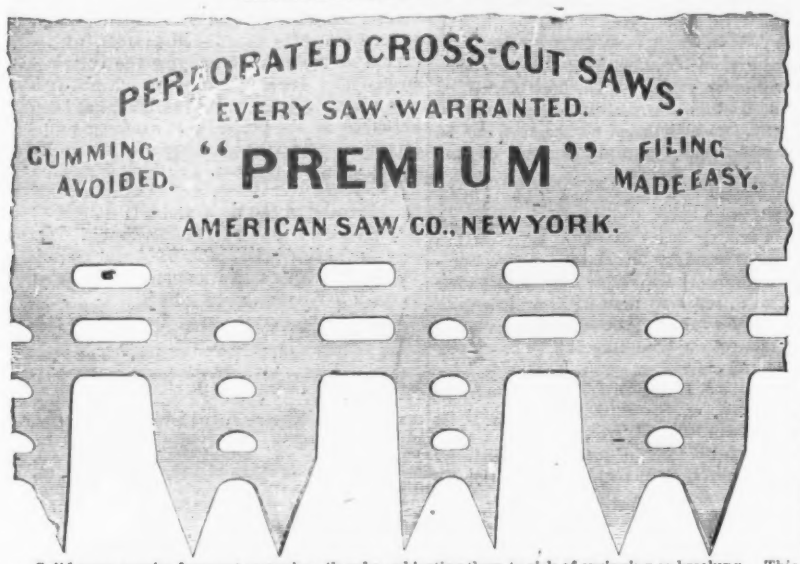
MANUFACTURER OF

SAWS OF ALL KINDS.

FACTORY, WILLIAMSBURGH, N. Y.

AMERICAN SAW CO.,

TRENTON, NEW JERSEY.

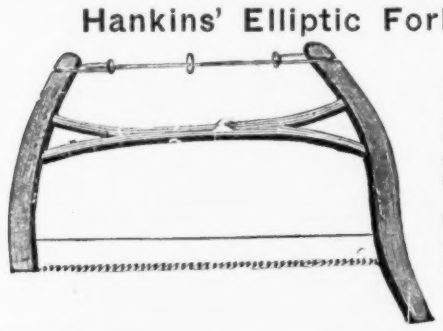


Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having *Patent Teeth*. In the perforated saws **all gumming is avoided** and the teeth are easily kept long and in *proper shape*, saving *files, labor, expense* and *vexation* As is well known, our saws cut faster, smoother and easier than any other.

MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.

Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any centre bolt, secures for the Frame great strength and durability.

These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE
VULCAN SAW WORKS,
WILLIAMSBURGH, N. Y.

YALE LOCK MFG. CO.

Office and Works at STAMFORD, CONN., Salesroom 298 Broadway, N. Y.

In addition to their line of Celebrated Locks, would particularly call the attention of the Hardwa trade to their extensive manufacture of

ORNAMENTAL **REAL BRONZE** HARDWARE,

Illustrated Catalogues of which will be furnished on application.

These goods are equal to the **best in the market,** while their **prices are very favorable.**

NEW YORK SCREW BOLT WORKS.

(Estate of R. J. DEWHURST, deceased.)

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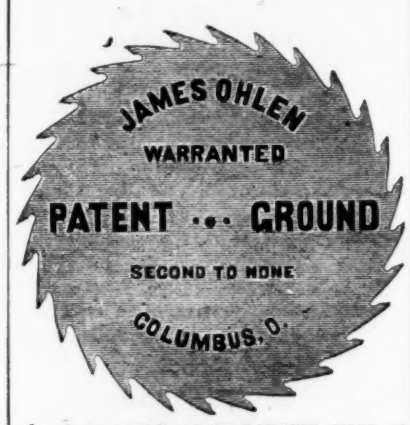

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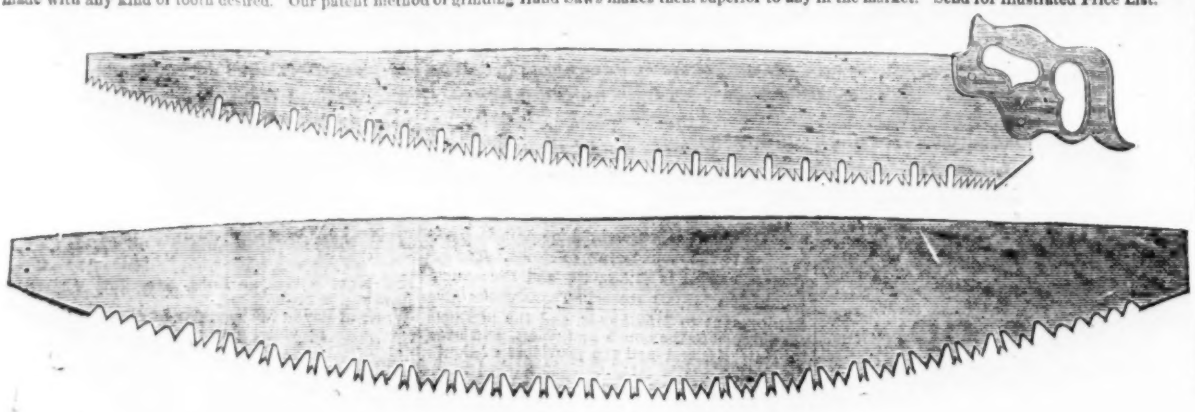

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Shaw's Relief Block for Rolling Mills.

The invention, which is herewith illustrated, is designed to prevent the breaking of housings, rolls, and other gearing pertaining to rolling mills, and to afford instant relief when the engine is overloaded. In order to fulfill the object mentioned, the demands made upon the invention are peculiar, for it will be observed that the power of a rolling mill is a thing not to be trifled with, that no elasticity is permissable, that the adjustment should be under perfect control, and not liable to disorder when adjusted, and that the parts should be so arranged that the operator will be enabled to release a load of 500 to 1000 tons with an ordinary bar wrench, when emergency requires.

All of the foregoing points are met in Mr. Shaw's Relief Block, which consists of an obtuse wedge C (Fig. 1), supported on the top of its bed plate A, of corresponding angle. The

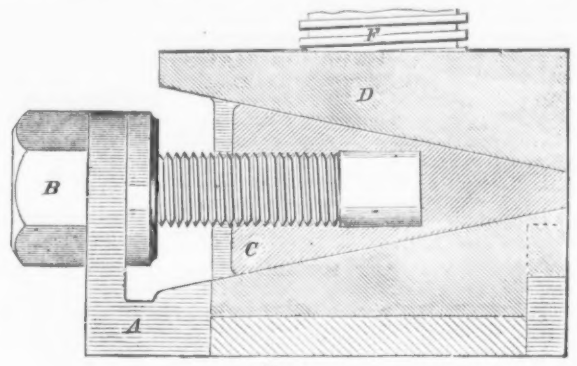

Fig. 1.

said bed plate terminates in a flange on its outer end for the reception of the collars of screw B, which screw is tapped in to base of wedge C, and controls the movements of the same. The wedge C is covered by a top plate D, having side wings, as shown in (Fig. 2), reaching down to plate A, to prevent any lateral movement of the three separate parts. The angles of wedge C are made sufficiently obtuse to cause the wedge to be squeezed outward whenever pressure is applied, but the angle should be so acute as not to give any great force

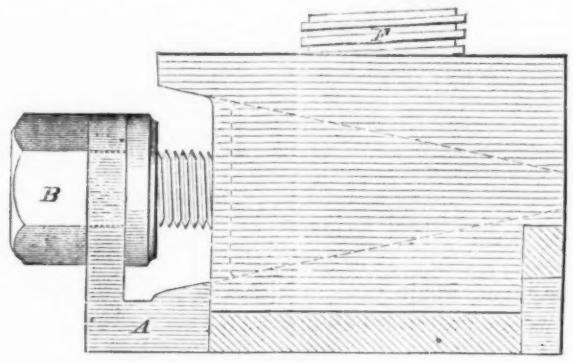

Fig. 2.

to this outward tendency. This angle will vary with the material employed in its construction; with steel, three inches to the foot being a sufficient angle for each side of wedge C. Whenever it is desired to withdraw the wedge, it is only necessary to apply a spanner wrench to the head of screw B, which can be revolved under all loads. This relief block is placed in an ordinary housing G (Fig. 3), on top of the journals of rolls I and H, and the housing screw F, pressed upon the top of said relief block. It will be observed how easily this invention accomplishes its task of relieving the screw,

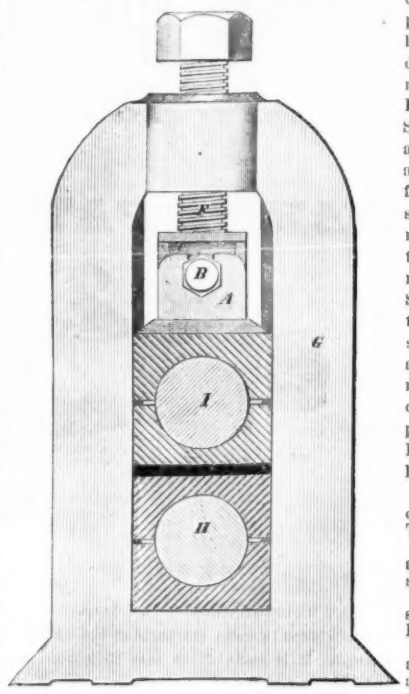

Fig. 3.

rolls and housings of the severe strain, when metal is caught and locked between the rolls, by using the force of the strain between the journals to eject an obtuse wedge at the will of the operator. The relief block is perfectly solid and free from all elasticity (unlike hydraulic presses tried for the same purpose), and will always maintain the hight at which they are set, and can be used for slight adjustments of the rolls when required; and by introducing them, it will no longer be necessary for rolling mill owners to place engines of 50 to 70 per cent. of excess of power, to crowd through the rolls whatever may be placed between them without regard to the strength of rolls and housings, to the imminent risk of breaking and damaging expensive machinery.

All machinery liable to excessive strains should have a limit of safety before its maximum strength is reached. In rolling mills, this engine is the best safety valve for overstrain, which should be so proportioned with steam, as to stop the engine before breaking the machinery.

There need be no fear of the engine slacking up under ordinary work, for the damaging strain is from 50 to 100 per cent. in excess of ordinary loads. Whenever the engine slacks speed from excessive strain, liable to break the machinery, instant relief can be afforded by the relief block here described.—*Journal of the Franklin Institute.*

The Extension of the Bessemer and Martin Processes for the Manufacture of Steel in Germany.

By W. HUPFELD, Superintendent of the Foundry at Prevali.

No branch of the iron industry in the German confederation has in the past years increased so rapidly as the manufacture of steel. For years people strongly opposed the new cast steel methods, and particularly regarded the puddled steel as the only trustworthy material for the manufacture of rails. The last few years have, however, brought about a change in the views of the consumers, and the great demand at the termination of the French war has occasioned the erection of numerous new steel works, which even now have reached a really immense productive capacity, for which it may be difficult to find a market in the home trade, and which will be yet greater upon the completion of the works in process of erection. Naturally, the most numerous and more conspicuous works have risen in the Rhine and Westphalian coal districts, though there are others isolated in different industrial provinces.

The Achilles' heel of the German Bessemer steel manufacture was, until now, its inevitable dependence upon the English pig iron, which, but a short time ago, was held indispensable, and against which, in Germany, only the George Marien furnace ran in competition, as the Hoerder Bessemer pig iron had not yet entered the market. Since its deliverance from this dependence, the German industry has made great advances. In this relation, Krupp, Hoerder, Bochumer Steel Works, Dortmunder, Union, Phœnix, and Good Hope furnaces, as also the Bavarian Max foundry and the Princess Maria foundry, have spared no effort to procure suitable ore for the production of Bessemer pig iron in their own works, and, in this regard, have not been confined to Germany, but have extended their inquiries to Spain, Algiers, and Sweden. In this connection it is striking, that on the Upper Silesia side, especially at the favorable establishment at the Kœnigs furnace, until now no experiments in reference to the Upper Hungarian ore had been made. Apart from some unimportant charcoal furnaces in Thuringia and Eifel, there are in blast at this time exclusively for Bessemer iron:

Three furnaces of the Bavarian Max Works, out of feldspathic and brown ironstone of the Thuringian dolomite and graywacke at Eichicht.

One furnace of the Princess Marien Works, at Zwickau, out of feldspathic and brown ironstone at Gera.

One furnace of the Saxon Iron Industry Association, at Pirna, out of magnetic ironstone at Berggieshuebel.

Five furnaces of the George Marien Works at Osnabrueck, out of friable, but very clean and manganic brown ironstone of the Huegel.

Three furnaces of the Hoerder Union, out of the Siegen, Nassau and Eifel ore.

Two furnaces of the Dortmunder Union at Dortmund, out of Spanish, Algierian, Siegen and Nassau ore.

Two furnaces of the Good Hope factory, at Oberhausen.

One furnace of the Phœnix furnace, at Ruhrort.

Three furnaces of Krupp's Johannis Works, at Dinsburg, also with Spanish, Algierian, Siegen and Nassau ironstone.

There are a number of furnaces being constructed: two at Bochum, one at Dortmund, others at Krupp's Johannis Works, and at various localities. If we estimate for every furnace a yearly production of from 125,000 to 150,000 cwt. pig iron, a present manufacture of 125,000 to 150,000 tons of German Bessemer raw iron results. Beside the productive capacity of the well known steel works, this amount is far from touching the limit. For instance, there are (at work, or in course of erection) the following Bessemer converters:

Two at the Max furnaces, at Regensburg.
Four at the Princess Marien furnace, at Zwickau.
Two at the Koenigs furnace, in Upper Silesia.
Four at the Osnabrueck steel works.
Four at the Hoerder Hermanns foundry.
Two at Hoesch, in Dortmund.
Four at the Dortmund Union, in Dortmund and Hattingen.
Seven at the Bochumer steel works.
Two at the new steel works, at Bochum.
Eighteen at Krupp's, in Essen.
Four at the Good Hope foundry, at Oberhausen.
Two at Phœnix, in Ruhrort.
Six at the Rhine steel works, at Meiderich.
Two at Poensgen and Giesbert, in Dusseldorf.
Two at Red Earth, at Aachen.
Two at Steinhauser foundry, in Witten.
Two at Glenauth Bros., in Kaiserlautern.
Three at Dietrich & Co., in Niederbronn.

in all 71 converters,

If we allow for 60 furnaces in action, and for each one a yield of 500 cwt. daily, we have a daily average of 30,000 cwt. Bessemer steel, or a productive capacity of 9,000,000 cwt. in a year.

For this, 10½ to 11 million cwt. pig iron is needed, also, after the deduction of the present German yield, an import of 7½ to 8 million cwt. foreign Bessemer iron. Should this amount, easily attained with the existing conveniences, be exclusively turned into rails, it would give 8 million cwt. steel rails, or a supply sufficient to lay 3330 miles of a single track railroad.

For the Bessemer steel manufacture the pig iron is fused in cupola furnaces, which are usually worked with Root's blasts; for the specular iron addition, which, with the increasing use of the German spiegeleisen, is diminishing, they employ small blast furnaces. The converters at their maximum capacity hold five to seven tons, and are constructed on the English models, with hydraulic turners, cast cranes, ingot cranes and semi-circular mold stands. At the Steinhauser works and in Dortmund they run the iron in vessels placed upon trucks below, thus dispensing with molds. Amongst the blast engines, both upright and horizontal, twin engines are chiefly used, provided throughout with a proportionate long action, also constructed on large dimensions. The Bessemer steel is exclusively applied to rails, axles and tires, rarely used for plates, small wares or cast pieces, though the last named are made by Grenauth Bros. The method of this manipulation is peculiar. In the majority of cases the blocks are hammered beforehand, or, as in Bochum, rolled; only at Steinhouses factory the small blocks are ready at once to shape, and are even cast outlined. The rail lathes, always with triple rollers, are generally highly powerful, and with correspondingly heavy engines, which facilitate a production of from 250 to 400 pieces per day. Reversing engines for rail turning are unnecessary; they cut tires out of huge blocks. The plates from these blocks are got out under hammers, their width being 10 to 15 inches, which are broken cold, then perforated, and under upright heat turners finished. For the most part they hammer the axles under hammers into sockets all ready; the forging plays a much greater part than in interior of Austria, on account of the inferior quality of the steel. The Bessemer fragments (rail ends, etc.) are either worked into smaller wares, or placed in a converter, or finally used as material for Martin-steel.

The Bochumer cast steel works have an extensive foundation laid, and probably the finest furnaces already in action. Altogether there are probably 50 furnaces in blast, which have a daily productive capacity of 4000 cwt., if we only allow 200 cwt. steel to a furnace, and calculate that one third are in daily use. There is every modification of this process in use, utilization of the steel scrap, welding of wrought and raw iron (scrap process), and finally addition of iron stone partly after the Siemens method for the direct wrought iron manufacture out of ore. The last modification, namely, addition of reduced iron dross in place of ore is employed by the Dortmunder Union in steel manufacture. This is the material out of which the axles, rails and ties are manufactured which figured at the Siemens exhibition, and which by many was falsely regarded as the products of direct steel manufacture from native ore. In common, the Martin steel is looked upon as a transition between Bessemer and crucible cast steel, and it is specially adapted to casting in molds, for which, on account of its greater density, it is better suited than Bessemer steel. In this direction a great field of usefulness lies open before the Martin steel, as, on the one hand, for coarser articles it supersedes the more costly crucible steel, and, on the other, for all casts in which people look for greater hardness united with strength, viz., rollers, shafts, spindles, etc., it can replace with great advantage the cast iron.

Catasauqua.—The following notes are taken from the Catasauqua (Pa.) *Dispatch*: The officers of the Crane Iron Company, of this place, are not in receipt of orders to start the furnaces, which will be ready in about two weeks. Considerable repairs are being made, which will require some time to complete. The application of men for work are numerous, and several hundred more than necessary could have been employed, but the company have not decided upon the time of commencing again, and do not require more laborers at present. The works are having a coat of mineral paint put on them, and with the other improvements recently added, are presenting a different appearance from former days.

The Crane Iron Co. have on hand about one thousand tons of iron, which, during good business times, would have been sold in a few days. The strike occurred on the 17th of February, and yet this amount of stock remains on hand. Dull trade.

The rolling mill at this place and Fern Dale are increasing the number of working days, but the price of iron is at such figures that the profits of manufacturing are very small. Now that the finance question has been determined by Congress, there may be some chances for a brightening of business.

The Union Foundry and Machine Company are experimenting with a new machine for polishing and straightening shafts, but as yet with very little success. The machine is the invention of a man in New Haven, who has disposed of it to a company of capitalists in this place, but its success is not yet complete.

The Iron Age.

New York, Thursday, April 23, 1874.

DAVID WILLIAMS . . . Publisher and Proprietor.
JAMES C. BAYLES . . . . Editor.
JOHN S. KING . . . . Business Manager.

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City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*: also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

In response to many requests for copies of the tables showing the cost of pig iron on furnace bank and bar iron at mill, from 1850 to May 1st, 1874, compiled for *The Iron Age* by Mr. Wm. E. S. Baker, Secretary of the Eastern Iron Masters' Association, we have had them reprinted upon heavy Bristol board, 9 by 14 inches, also upon paper, for folding in letters. Copies may be had, without charge, upon application at this office.

The State of Trade.

Earnestly as we have sought during the past few weeks for some indications of a substantial improvement in the condition of the iron trade, we are compelled to confess that we have not found them. As our readers know, we are always disposed to look with hope and confidence upon the future, and we do so even now; but it cannot be denied that the present condition of trade is as bad as it well could be, and that if relief does not soon come in some manner which cannot now be forseen, many failures would seem to be inevitable. Pig iron is in oversupply, and furnaces most favorably located and with an established reputation for their iron, are either piling up their product in the hope of selling it eventually, or standing idle, with no hope of soon resuming operations. For manufactured iron the demand is so limited as to effect no perceptible reduction of stocks in store, and there is no sign of improvement. Labor is discontented with reduced wages, and is assuming a menacing attitude, although we think the men are not so blind as not to see that the threatened "general strike" would be the last straw needed to break the camel's back, and that after such a demonstration as they now propose, the chances of obtaining any employment through the summer would be exceedingly small. There has also been a very general suspension or curtailment of mining operations, owing to the small demand for ores. The trade is now feeling most seriously the effects of the late panic, as the orders which kept the works running for a time have been filled, and no new orders are coming in. Many prominent iron merchants and manufacturers express the belief that no marked improvement can now be looked for until fall, and in such an emergency as this we can only advise our friends in the trade not to take counsel of their fears, but to move cautiously and reduce expenses wherever such reduction is possible. A glance at the statistics of our national development will show that the present depression cannot long continue, unless recovery is retarded by a mistaken policy of financial legislation; but with trade in a worse condition than it has been within the memory of a majority of our iron masters, we do not consider it safe to venture any very hopeful prediction for the immediate future.

It is, perhaps, some poor satisfaction to know that the depression in the iron trade is not limited to the United States, but that it is felt in a greater or less degree in all the iron producing countries of the world. In England the situation is described by a leading iron trade journal as "desperate." British makers are undersold in their own market by Belgian agents, who, for lack of profitable orders from Continental consumers, are selling very cheap in England, where the unreasonable demands of the workmen for wages, altogether disproportionate to the profits of iron manufacture, render it impossible for the masters to take contracts as cheaply as they can be filled in Belgium at the present time. From other parts of the Continent we hear no very cheerful reports, and it is evident that iron masters in all parts of the world will have to content themselves with small profits for some time to come. This condition is probably the natural effect of sudden and sharp reaction from undue stimulation and high prices. The pendulum swung beyond its limit in one direction, and now seems likely to swing as much too far in the other. This may the sooner restore the true equillibrium; but the first effect is to paralyze industry and disorganize commerce. Another year will probably see us entering upon a long and comparatively uneventful period of steady development and moderate prosperity; but it is quite certain that for many years to come skillful management and close economy will be the conditions of success in all branches of iron manufacture, and that the future of this industry depends in a great measure upon our ability to make iron at a price which will enable us to export our surplus production.

Now Give Us Free Banking.

The President has vetoed the currency bill, the long anxiety for a settlement of the currency question has ended in disappointment, and the promise of relief to commerce and manufactures still remains unfulfilled. It is not probable that the bill will be passed over the veto, and the country now looks to Congress for some measure of relief which will be immediate in its benefits and permanent in its operations. What shall this be? We answer unhesitatingly—*Give us free banking.*

As the term "free banking" is used among business men, it does not mean absolute freedom, but freedom to establish as many banks, and to issue as many notes, as the country requires, under the national banking law which requires the deposit of government bonds with the treasurer at Washington to secure circulation, and with some provision for redemption which does not now exist The wants of the merchants and manufacturers of the country are better expressed in Mr. Merriam's bill, reported to the House by the Committe on Banking and Currency on the 29th of January, and then committed to the Committee of the Whole, than in any measure yet proposed. This bill, 1st, removes all existing restrictions upon the volume of national bank notes, and allows their unrestricted issue, based upon deposits of United States bonds; 2d, it requires each bank to keep a deposit of five per cent. of its circulation in legal tenders at the Sub-Treasury at New York for redemptions, in lieu of the present reserve of fifteen and twenty-five per cent.; 3d, it requires the Assistant Treasurer here to redeem in legal tenders all bank notes presented for payment, and return them to the banks from which they emanated; 4th, it does away with the present system of keeping reserves with redemption agents, and requires every bank to keep what reserve it requires in its own vaults. This bill should be promptly passed. It mitigates or reforms all the evils of our present national bank system: it permits the establishment of national banks wherever they are needed; it insures us all the currency we need, and carefully guards against an overissue of currency—which, however, would not depreciate so long as the government bonds are worth ninety per cent. of their face value—by requiring the banks to provide for the redemption of their notes in legal tenders; it would meet the wants of the country without adding a dollar to the national debt; it would give us an abundance of currency without the much dreaded "inflation," and would encounter no serious opposition in any quarter. We call upon the friends of commerce and industry in Congress to push this bill, or one embodying essentially the same provisions, to a prompt consideration and passage. The country needs it, public opinion demands it, and there is no danger involved in the experiment. If new banks are not needed, capitalists will not go into the business; if more currency is not needed, the banks cannot issue it, for no one will borrow it. Three years ago, Hon. Daniel J. Morrell, then representing the State of Pennsylvania in the House of Representatives, urged the claims of freedom of banking upon his colleagues in terms so clear and forcible, and which so well express the views of a large and influential class of merchants and manufacturers, that we quote from his speech to give additional force to what, in the brief interval between the reception of the news of the President's veto and the hour of closing our forms, we have been able to say:

> The only safe means of distributing and regulating the volume of the currency is through local banks which receive deposits and make discounts in accordance with the business requirements of the communities which they serve. Any other way of swelling or reducing the volume of currency cannot be healthful, and its effects must resemble the temporary stimulation of intoxicating drinks and the depression which follows a debauch. The national banks are in successful operation; men of all parties, professions and occupations are stockholders, and their management is free from political or sectional influence. Their officers necessarily have an accurate knowledge of the resources and necessities of the people and possess their confidence. Being independent of the national administration, yet subject to inspection, and liable to forfeiture of privileges which are abused, they are a check upon the treasury, and the treasury a check upon them.
>
> That the banks have made large profits is chiefly owing to causes which have made all money capital productive, and is no evidence of the faults, but rather of the virtues, of the system. Make banking free, and it will cease to be unduly profitable. They will have only such profits upon their business and circulation as can be realized under free competition, money at the same time being plentiful.

This is a common sense, business view of the subject, which commends itself at once to the judgment. We may add, that free banking places no obstacle in the way of a resumption of specie payments, whenever such resumption is possible, and we hope Congress will not delay the earnest and intelligent consideration of the measure an hour longer than is necessary.

Thoughts Suggested by the Recent Disasters at Sea.

Of what advantage are the so called "water tight bulkheads" of our iron steamships? The agents of the various lines lay great stress upon the fact that their vessels are all "compartment ships," and nervous voyagers are assured that it is next to impossible to sink them, no matter what may happen, for if one compartment fills with water the others will float the ships for an indefinite period It costs considerable to put these bulkheads in, they are very much in the way after they are in, and they render no service in strengthening the ships which could not be performed at once better and cheaper with less iron; their only function is to give the ships buoyancy in case of accident, and if they do not do this to an extent sufficient to keep a ship, which happens to spring a leak in one compartment, from sinking at sea, of what possible benefit are they to any one? A few years ago, when the bulkheads were removable, it was not an unusual thing for captains to lay them down in the ships' bottoms and pile cargo on them, or to leave them on shore in some convenient storehouse. Now that they are built in with the ship, they seem to be of scarcely greater utility than when they were left on shore, or utilized as flooring in the hold. The French line has lost two compartment steamers, and nearly lost a third; the Allen line lost seven; the Anchor line lost one a year for several years; the White Star line one; and the Inman line several—we do not now recall just how many. We believe these were all compartment ships, and the question whether these compartments are really useful for anything beyond advertising purposes is, certainly, a very natural one.

Another question of equal importance suggests itself in this connection. If transverse bulkheads do impart additional security to a ship, is not an undue dependence placed upon them, and do not the owners neglect, in consequence, precautions which are indispensable to safety? It would certainly appear so in the case of the *Europe*, which was so insufficiently provided with pumps that the salvage crew from the *Greece* could not keep her afloat, although the water in the hold had only gained one foot in eleven hours, during which time she was left without a soul on board. Of the truth of this assertion there can be no doubt. Salvage crews will take any reasonable risk to save the vessels committed to their care, and they will not leave them while a chance remains of getting them into port. In the case of the *Europe*, Mr. Buck, the officer in command, testifies that he could probably have taken her into port had her pumps been equal to even a moderate service, far below what should have been their minimum capacity. This is a matter which calls for intelligent investigation.

It is useless to call for the enactment of laws for the better protection of life at sea, or to call upon the owners of steamships for reforms of any kind. The only remedy lies with the marine underwriters, and until they are prompted by self-interest to decline taking risks upon vessels which are not as safe and strong as it is possible to make them, more attention will be paid to upholstery and the comfort of passengers than to the means of guarding against disasters at sea. Cheap marine insurance gives us unseaworthy ships, as cheap fire insurance upon land gives us cities which can be swept away in an hour by conflagration. Mr. Plimsol has shown us what appalling abuses have grown up in the British merchant service, as the legitimate result of the willingness of underwriters to insure unsafe ships, and equally courageous investigators would find but little difficulty in showing that the evil effects of this system have spread to all branches of ocean carriage, though the effects are less marked in the cases of the "floating hotels" which ply across the Atlantic, than in those of old and rotten merchantmen sent on distant and dangerous voyages for the purpose of being lost or, as the phrase goes, of "selling them to the underwriters." Mr. Mackenzie, agent of the French line, states that the company will not be pecuniarily affected by the loss of the *Europe* and *Amerique*—supposing at the time that the latter had gone down—although they might be put to temporary inconvenience in finding ships with which to maintain their regular weekly service. As it is, the losses fall upon the insurance companies, and if they are as ready now to write upon steamers insufficiently provided with pumps, upon old side-wheelers lengthened into modern propellers, and upon unseaworthy hulls generally, as they have been in the past, the loss of half the steamers afloat would teach the owners of the other half nothing which would diminish the dangers of ocean travel. Like all evils, that of cheap insurance upon doubtful and hazardous risks will ultimately cure itself through the abuses to which it gives rise; in the meantime we look for but few reforms, so long as the saving of life is the only object to be gained thereby.

The Centennial.

In another column we publish an address to the people of the State of New York, signed by Mr. John Welsh, President of the Centennial Board of Finance, which merits the careful and thoughtful attention of business men. It sets forth that, as nearly one-half of the money needed to carry out the great undertaking has been subscribed, its success is assured; but that it is important to complete the preliminary arrangements at an early day, in order that each State in the Union may be properly represented in the exhibition. The total capital stock of the Centennial, as fixed by Congress in June, 1872, is ten millions. Of this, about four millions have already been raised by public and private subscriptions in Pennsylvania, New Jersey, New York, Delaware, Rhode Island, Arksansas, Virginia, Iowa, Illinois, Indiana, Ohio, Alabama, Wisconsin, Michigan, Missouri, Nebraska, Oregon, Montana, Nevada, Louisiana, Florida, Maryland and California. For reasons set forth at length, the people of New York are asked to assist the work by more liberal subscriptions than they have hitherto made. We hope the appeal will meet with a generous response.

In Congress, the cause of the Centennial is looking up, and the chances are better than ever before for an appropriation of $3,000,000 to nationalize and stimulate the enterprise. On Monday Mr. Kelly succeeded in having the bill appropriating $3,000,000 taken from its place on the calendar and made the special order for May 5th, by a vote which clearly indicates that it will pass when it comes up for consideration. The friends of the Centennial may, therefore, consider that they have won the fight, and that, unless some unforseen obstacle should interpose, the work will go on rapidly to a successful consummation. We hope Congress will not impose upon the commissioners any absurd conditions, or place any obstacle in the way of making the Centennial an international exhibition; but that it will authorize the President to direct our diplomatic agents abroad to use all reasonable means to secure the fullest co-operation of foreign powers. We should, at best, only gratify a petty national vanity by limiting the exhibition to goods of American manufacture or production, while we should lose the benefit which would come from the comparison of our products with those of other nations. Narrow selfishness would prompt us to exclude foreign exhibits: enlightened self-interest would lead us to invite them. Very much of the commercial advantage which may reasonably be expected to result from the Centennial, depends upon the coming of foreign visitors, and if we make it strictly and exclusively national in character, the people of other countries will not trouble themselves to come and see it.

The Smoke Nuisance in Manufacturing Cities.

In many of our Western cities, especially those which consume large quantities of coal for manufacturing purposes, the pollution of the atmosphere by the clouds of smoke continually pouring from the chimneys, is not only an extravagance which must be paid for by the consumers of manufactured products, but an intolerable nuisance as well. Can this waste of fuel—for smoke is only the product of imperfect combustion—be prevented, and the nuisance abated? The question has often been asked and often answered, but in few instances have attempts been made to apply the remedies which have been found successful by experiment. The reason for this is probably found in the popular belief that coal is plenty, and that it is cheaper to waste a little of it than to adopt the appliances needed to insure its perfect combustion in the furnace. Were coal worth only half its present value, the idea that it could be economically wasted—if a term so seemingly contradictory is admissable—would be a mistaken one. Improvements in furnaces are paid for only once—a waste of fuel is a constant tax, which must be added to the cost of production as long as it continues. It is not our intention to discuss the subject at much length, but as it involves the consideration of principles which should receive the careful study of all who make or use stoves and furnaces of every kind, it cannot be without interest to our readers.

It is important, at the outset, to divest the inquiry of an element which needlessly obscures the subject, and leads to erroneous ideas. Smoke and soot arising from the imperfect combustion of fuel never are, and probably never will be, consumed after they are formed. All useful inventions designed to abate the smoke nuisance are simply contrivances for preventing its formation. The first product of a freshly lighted coal fire is not smoke, properly speaking, but a volume of crude, impure coal gas, or fuel in a minutely divided, or diffused, and partly volatilized condition. What is needed, and all that is needed, is to introduce sufficient air among the solid portions and gaseous products of the fuel to effect and sustain perfect combustion, and when this is done the only product will be gases which have no affinity for oxygen and which cannot be consumed. When this is attained the combustion of the fuel will be perfect, and there will be no waste.

It need not be supposed, however, that the introduction of air at the right place and in the right quantity needed to prevent the formation of smoke, is as simple a matter as it would appear at first glance. If it were, the evil of smoky towns and begrimmed populations would long since have ceased to exist, both in Europe and in America. It is not sufficient to supply the furnace with an adequate quantity of air. This much could easily be effected by simply opening the furnace door, and the result of it, so far from suppressing the smoke, would only be to cool the furnace. Hence the introduction of air can not be effected *en masse*, but must be so proportioned and diffused as to become intimately and rapidly mingled with the products of combustion, and this mingling must take place without any reduction of the temperature within the furnace, otherwise the desired result will not be attained. A perfect furnace would be one where the due proportion of air could constantly be admitted at the precise points where the incessant formation and evolution of foul gases was going on. If at every stage of the fire, from the moment of coaling to the time when it becomes bright and clear, only the requisite quantity

of air were admitted, smoke would not be evolved at all.

Experience, however, has shown that by no invention yet applied can the formation and diffusion of smoke be wholly prevented, although in some places a near approximation to this desirable result has been reached. The most successful of the manifold inventions for suppressing smoke, appear to be those which introduce the atmospheric air by numerous small apertures at the bridge of the furnace, so as to diffuse it in streams and jets among the gases before they ascend the chimney flue. With such devices, however, quite as much depends upon the skillful management of the fire as upon the machinery employed. To obviate the evils resulting from inattentive firemen or stokers, some patents supply the fuel to the furnace by machinery; the grate being also made to revolve, is thus kept constantly supplied with an even layer of fuel. Being self-feeding, it requires no skill on the part of the fireman, who has merely to fill a large hopper with coals two or three times a day. This invention has been measurably successful, but the very regularity of its mechanical action is sometimes a serious disadvantage, because it prevents the fireman, in case of an emergency, from urging his fire, or creating "high pressure." It also requires that the furnace should be very large, and that there should be a surplus of boiler room. It can be adapted to few furnaces already built, and its expense is, therefore, a serious drawback.

This subject offers an inviting field for investigation and experiment, and whoever shall succeed in doing what the many inventors who have obtained patents have failed to accomplish, or accomplished only in part, will reap a profit that will more than compensate for the time and labor expended. The gas generated by a ton of bituminous coal measures about ten thousand cubic feet, and it requires about ten times its volume of atmospheric air (or one hundred thousand cubic feet), while the coke portion of the same ton of coal will require a further amount of two hundred thousand cubic feet of pure air, in order to effect its complete consumption. How to supply this air, as, and when, it is needed, is the question for which our furnace builders have hitherto failed to find a satisfactory answer. We incline to the belief, however, that were smoky chimneys declared public nuisances, and coal consumers required by local ordinances to abate that nuisance, a means would soon be found for so doing, to the permanent advantage of all classes of the communities now required to breathe smoke impregnated air.

New Publications.

THE APPRENTICE, OR FIRST BOOK FOR MECHANICS, MACHINISTS AND ENGINEERS. By OLIVER BYRNE, NEW YORK. A. J. FISHER, pp. 207.

This little volume, which is printed in excellent type, on good substantial paper and neatly bound in boards, supplies the want so long felt of a thorough elementary treatise on practical mechanics.

To understand the so called elementary treatises on the theory and application of mechanics, used in our schools and colleges, requires a greater amount of mathematical knowledge than is usually possessed by artisans, and even when the information contained in them is acquired, it is seldom of much value to the practical man. Mr. Byrne's book, unlike those more elaborate and abstruse works, embodies all the information necessary in an elementary work of this nature in a practical, concise and comprehensible form. The system pursued is inductive and simple, the illustrations perfectly clear, and the explanations which accompany them unusually lucid. It is too frequently the practice to encumber works of this nature with unnecessary verbiage and roundabout explanations which only serve to confuse the student. This common defect is most adroitly avoided in the present volume, the instruction contained in it being always conveyed in intelligible and brief terms. We regard it as a most serviceable contribution to the literature of mechanics.

Our Foreign Trade in Iron, Metals and Manufactures thereof.

The forthcoming report of the Bureau of Statistics for December, 1872–1873, and the calendar years ended therewith, makes the following showing of imports of metals into the United States for the two years:

	1872.	1873.
Brass, and manufactures of..	343,469	191,237
Copper, and manufactures of	2,411,759	3,116,490
Iron, pig	5,181,847	7,269,850
Iron castings	19,169	38,564
Iron, bar, boiler, band, hoop, scroll and sheet	6,153,564	6,909,146
Iron rails	4,708,189	14,498,012
Machinery and other manufactures of iron	3,681,722	2,908,701
Steel, ingots, bars, sheets and wire	3,865,316	4,106,087
Steel railroad bars	8,984,103	8,207,013
Steel, manufactures of	10,109,901	10,169,391
Lead, pigs and bars	2,561,035	3,172,034
Metals and metal compositions	1,190,547	913,652
Tin, in bars, blocks and pigs.	3,048,396	1,317,357
Tin, in plates	14,340,868	13,893,450
Zinc, spelter, and manufactures of	794,412	1,303,938

The exports of iron, steel, metals and their manufactures for the years 1872 and 1873 were published in our issue of April 2 from advance sheets furnished us by Dr. Young.

The following are the total values for the year ended December 31, 1873, as compared with 1872:

	Imports.	Domestic exports, (specie values.)	Foreign exports.
1873	$624,997,362	$606,366,531	$24,968,204
1872	677,144,579	544,438,789	25,086,083

Classified as follows:

	Imports.	Domestic exports, (specie values.)	Foreign exports.
1873.			
Specie & bul'n.	$29,749,439	$56,263,496	$7,308,892
Merchandise ..	595,247,923	550,103,036	17,659,312
1872.			
Specie & bul'n.	21,182,004	92,295,286	8,391,688
Merchandise...	655,962,575	452,143,553	16,694,395

1873.	Imports.	Foreign exports.
Free	$171,222,761	$10,814,120
Dutiable	453,774,691	14,154,084
1872.		
Free	115,235,436	10,478,186
Dutiable	561,869,143	14,607,897

Allowing for the difference in the warehouse accounts, the exports for the calendar year 1873 are in excess of the imports by $289,331, while for 1872 the imports exceeded the exports by $108,473 713.

The New Canadian Tariff.

The following is an abstract of the new Canadian tariff which went into effect on the 15th inst.:

Goods paying 10 per cent. ad valorem.—Locomotive engine frames, axles, cranks, hoop iron or steel for tires of wheels, bent and welded crank axles, piston rods, guide and slide bars, crank pins and connecting rods, machinery for mills and factories which is not manufactured in the Dominion.

Goods paying 5 per cent. ad valorem.—Ships' materials, viz.: Binnacle lamps, blocks and patent bushes for blocks, bunting, cables, iron chain of all sorts, compasses, dead eyes, dead lights, deck plugs, knees, iron masts or parts of, iron pumps and pump gear, riders, iron shackles, sheaves, signal lamps, steering apparatus, traveling trucks, wedges, wire rigging, cables, hemp or grass cordage, sail cloth or canvas, varnish, black and bright iron scraps, galvanized or pig, bars, blooms and billets, puddled or not puddled, bolts and spikes, galvanized wire, steel wrought or cast in bars and rods, steel plates cut to any form, but not molded; copper in pigs, bars, bolts, and for sheathing; yellow metal in pigs, bars, and for sheathing.

Goods paying 7½ per cent.—Iron in bar, hoop, rod and sheet, nail and spike, rod, round, square and flat, Canada plates and tinned plates, rolled plate and boiler plate.

Scientific and Technical Notes.

There has lately been on exhibition in Chicago

A CURIOUS STEAM ENGINE,

invented by Mr. E. A. L. Roberts, of Titusville, Pa. It is described as follows: The peculiarity of Mr. Roberts' invention consists in having a double exhaust cylinder, the main escape of the exhaust steam being in the middle. The cylinder is constructed with a circular part, or slot, around the middle, the piston head being one half as long as the cylinder, less the width of the circular part or slot. It will be seen that when the piston head is at one end, and steam is admitted to force it to the other end of the cylinder, that the full pressure of the steam is held until the piston has done its work, when the exhaust steam is allowed to escape all around the cylinder, instantly increasing an almost perfect vacuum. The full force of the steam is employed, or, in other words, the steam does not "let go" until the piston has accomplished its full stroke. For instance, in a locomotive engine, 17x22, with the link in a certain position, in which the valve travels 2 2-16 inches, the live steam is cut off at three inches of the stroke, the steam commences to exhaust, forward and back, at 11 4-16 inches, leaving ten inches of space for the piston to move under a constantly diminishing force of steam. In the case of the central exhaust, which has a capacity about nineteen times larger than the other for disposing of the exhaust steam, the full power of the live steam is exerted the entire length of the stroke upon the piston head. The cylinder may be placed either vertically or horizontally, and if in the latter position, the central part affords an excellent opportunity for the water arising from condensed steam to escape without the use of cocks. Another important feature in Mr. Roberts' invention is the fact that the piston head, being long, has a better bearing upon the cylinder, and, of course, is less liable to wear than any other. By thus using the full power of the steam a less amount can be employed, together with a smaller cylinder, to produce a given power, which results in a saving of at least twenty-five per cent. in the fuel used. The motion being quicker by reason of the instantaneous exhaust, and the application of full power of the steam up to the instant of exhausting, the engine can be reversed, when running at a high rate of speed, with little danger, even with one cylinder, of striking the dead center; and in the trial recently, when the balance wheel was making 1000 revolutions a minute, the cut off was thrown back and forth, apparently hardly checking its velocity in changing its direction.

In a recently published essay on "The Use of Coke in Blast Furnaces," Ringel undertakes to show that

SMALL CHARGES IN BLAST FURNACES

are better than large ones. In a given case, other circumstances being the same, and the production the same, a small charge remains in the furnace three hours longer than a large one, and hence is longer exposed to the action of the gases, while the alternation of charges is twice as rapid, and thus the temperature of the carbureting and reducing gases lying above the zone of fusion is reduced, which causes a more perfect preparation. Beside, small charges possess the following advantages: *a.* The action of the ascending current of reducing gases is more intense because the hight of the column of ore is actually less. *b.* The rapid succession of charges, and consequent lower temperature, prevents their fusing together so as to form bridges and thus suspend the charge. *c.* The fuel is more completely used, for, by its broader distribution, a larger surface is offered to the air blast. *d.* Owing to the more intimate mixture of fuel and burden, the injurious constituents of the burden soon come into contact with such materials as will prevent their exerting an injurious influence on the product. *e.* Since this rapid alternation of charges prevents a high temperature in the portion of the furnace above the zone of fussion, it also decreases the injurious action of the sulphur given off from the fuel. The sulphur passing upward over the layer of ore meets with iron which is already sufficiently carbonized, so that it can only decarbonize it to a certain extent, without replacing the carbon entirely, as would be possible with iron but slightly carbonized. *f.* The low temperature of the upper part prevents the reduction of silicon.

In choosing large charges, especially of fuel, there has been a cardinal error, which, in spite of the alleged valuable increase in the heat of the furnace with large charges of fuel, has exerted the greatest influence on producing unsatisfactory results. In general, if 17 to 20 cwt. of coke be taken for a charge, as is customary in well managed furnaces, it is easy to prove that the results are far more satisfactory than when twice as much coke is used.

Frequently the broadest section of the furnace (at the boshes) is taken as the basis for calculating the volume of the charge of fuel, which is required to be such that when spread out in this section it shall still be thick enough (some metallurgists say 4 inches) to prevent the ore above from rolling through, whereby all would get too much mixed up in the lower part. This determination of the size of the charge, according to the section of the boshes, gives an unsafe result, since the different density of the coke never permits charging by weight, but always by volume. Charging fuel by volume, although admissable now and then, is absolutely useless.

As already remarked, small charges produce a stronger carburation of the iron, and hence it takes up sulphur from the fuel ash with more difficulty. Lime has a similar effect; it renders the charge less fusible, delays the descent of the charge, the carburation is greater, and the iron takes up less sulphur. When the fuel contains much sulphur, high carburation must be aimed at, for the more sulphur the iron takes up before fusion the less carbon it will contain.

M. Mayer, an electrician of Paris, has perfected the system of

CHIROGRAPHIC TELEGRAPHY

by the invention of an instrument which transmits a message in the handwriting of the sender. The message is written on metallized paper—*i. e.*, paper which has a sufficient metallic surface to conduct electricity, and that the writing fluid used must be a non-conductor. The metallized paper is wound round a cylinder, termed the transmitting cylinder, which moves with great regularity, and is insulated. Close to it is a micrometer screw, carrying a nut or slide, which, by the revolution of the screw, moves in a direction parallel to the axis of the cylinder. The slide carries a metallic brush and a style, which are insulated from each other and constantly rub against the surface of the paper. The parts are so geared and proportioned, that at each revolution of the cylinder the style moves one-fourth of a millimetre. Every portion of the surface of the paper, therefore, comes successively into contact with it, and into electric communication with the earth with which it is connected. At the transmitting station the positive pole of the line battery is connected not only with the line, but also with the metallic brush. The battery circuit is constantly closed, and the distribution of the current depends upon the position of the style. When its tracing point touches the metallized surface of the paper, the battery current takes the course of least resistance, passing through the brush, over the paper, to the style, and thence to the earth. In this case only a derived current passes through the line. But when the style is on any letter of the message, then as this letter is written with a non conducting ink, the short circuit is open, and the battery current is sent in its entirety through the line wire. So much for the transmitting part; but each apparatus is also provided with a receiving instrument, so that a *fac simile* of the telegram is produced at each station. Around the cylinder of this instrument a triangular metallic thread is so wound that the helicoidal figure it forms shall describe one convolution round the cylinder. This thread constantly rubs against an ink roller, and makes on the receiving paper a series of short lines which gradually become complete, and thus form the letters of the message. If we suppose the strip of paper upon which the despatch is to be autographed to be supported against and thus remain in contact with the helix of the cylinder, we shall at once perceive that this inked metallic thread will trace a straight line across the paper. On the completion of this line a second will be traced parallel with it, and so on. From this the necessity of breaking contact, or, in other words, of withdrawing the paper, will be apparent. The interruption is obtained in the following manner:

On the side of the cylinder, opposite to the inking roller, is a vibrating quadrangular frame, the ends of which extend beyond those of the cylinder and rest on pivots, so as to balance it on its longitudinal axis. A very slight elevation of that edge of the frame which is toward the cylinder, serves to bring the paper which is supported by the frame, in contact with the inked surface of the helical metallic thread; a depression equally slight withdraws it. The movement, which is almost instantaneous, is produced by an electro-magnet attached to the frame on the underside. Its poles, which are in opposition with those of a fixed permanent magnet, are, by their changing magnetism, alternately attracted and repelled. The current which produces this motion in the frame, and consequently the letters of the message on the paper, does not proceed from the sending station, but from a local battery, connected with a relay. This relay consists of a fixed steel magnet and of an electro-magnet, the core of which is in proximity to the poles of the permanent magnet.

The synchronism of the two instruments is established and maintained during transmission by concealed pendulums with very heavy lobs, and the transmitted message is reproduced in exact *fac simile*. The instruments are already in use between Paris and Lyons, and although comparatively slow, there working in other respects is entirely satisfactory.

Dr. J. P. Joule has lately conducted a series of interesting experiments to determine the

EFFECT OF COLD ON IRON AND STEEL.

The following is a translation of his account of the result reached:

1. A mixture of snow and sea salt having been placed upon a table, iron and steel wires were stretched in such a manner that a portion of their length was engaged in the freezing mixture, while the rest was free from it; in each case the wires experimented upon broke outside the cold mixture, the temperature of which was 12° C.

2. Twelve needles of good quality, about three inches long and 1-24 inch in diameter, were fixed firmly by their two ends at two inches distance from each other; a wire was then fastened by one of its ends to the middle of each needle, and attached at the other end to a machine for measuring the power of springs. The machine was then set in action until each needle broke. Six of the needles taken at hazard were tried at the temperature of + 13° C, and the six others in a freezing mixture, which reduced their temperature to — 11° 11° C; in the former case, five of the needles broke with forces varying from 1·134 to 1·842 kilogrammes, the sixth bearing 1·701 without breaking; in the latter case, five broke under forces varying from 1·134 to 2·041 kilogrammes, while the sixth bore a strain 1·701 without breaking. The result is curious, the lowest breaking point being identical in the two cases, while the highest occurred when cold was applied. Comparing the totals the averages are as follows: At ordinary temperature, 1·637; at — 11° 11', 1·801 kilogrammes. M. Joule had previously tried the elasticity of all the needles, and could find no difference between them.

3. It having been stated that the violent action to which a railway wheel tire is exposed resembled an active power rather than mere pressure, and, further, that cast iron was supposed to be more affected by cold than wrought iron or steel, M. Joule made an experiment of a different kind. He procured a number of cast iron nails, 1¼ inch long, and about ⅛ inch diameter in the middle, and having selected those of which the weights were as nearly as possible the same, he arranged each nail in such a way that a cutting hammer, weighing 5¼ lb., fell from a fixed hight on the middle of the nail, which was supported at each end. In order that the test should be as sure as possible, the nails were taken at hazard, and the trials with the cold nails alternated with those at the ordinary temperature. The nails were chilled by being plunged in a freezing mixture, and were struck with the hammer within five seconds of being taken out. Twelve series of these nails were experimented on, each series comprising sixteen nails, those which were not broken being added to the following lot. The results were as follows: Three series were tried at the ordinary temperature, being + 2° 22' C., the cold being increased from —12° 22' to —16° 67', and the fall of the cutting bit from twenty to thirty inches, and only one of the cold nails broken. In the fourth case the temperature being the same, but the fall increased to thirty-five inches, two cold and one of the other nails were broken. In the fifth experiment, the fall being increased to 39½ inches, one of each of the eight nails was broken. In the sixth experiment the cold was increased to 17° 78', with the same ordinary temperature, and the same fall of the cutter, and one of each eight again broken. In the seventh, the fall was raised to nearly forty inches, when only one of the cold nails was broken. In the next two experiments, the ordinary temperature was + 4° 40', and artificial cold, 16° 67'; when, with a fall of fifty nine inches, two cold and one other nails were broken; and, with a fall of seventy-five inches, three of each. Ten of the same nails were then tried at the same temperatures, with a fall of eighty-five inches, when two cold and one other nails were broken. The six remaining nails were then tried, three at the temperature of + 4° 44', and three at 16° 11', with a fall of ninety-eight inches, two only of the cold nails and three of the others being broken. Finally, an experiment was tried with fresh nails, twelve of which had been kept for four hours, at a temperature of — 16° 11', the ordinary temperature being + 5°, and the fall seventy inches, the result being the breakage of seven of the frozen and eight of the other nails broken. Total broken—twenty-two of the frozen nails and nineteen of the others.

Taking the whole of the above experiments into consideration, M. Joule arrives at the conclusion that frost or lowering of temperature does not render cast iron, wrought iron, or steel more liable to break, and that the accidents which happen on railways arise from the negligence of the companies in not submitting their wheels, axles, and all the other parts of their rolling stock, to practical and sufficient test before using them in the service of the line.

A communication lately read before the *Academie des Sciences*, on the subject of

SILICON IN PIG IRON,

claims that, instead of being an impurity, it is one of the indispensable elements in cast iron intended for conversion into steel by the Bessemer process. By combustion in the converter, silicon, we are told, develops three times as much heat as the same weight of carbon. Ores rich in silicon thus effect a great saving in fuel, and by maintaining a high temperature, produce a more excellent conversion into steel. A. M. H. St. Claire-Deville employs a special method of making pig iron containing a large percentage of silicon, which insures excellent results. The silicious pig is brought to a condition of fusion in a crucible of quick-lime, upon a hollow spindle fed by a stream of ordinary coal and oxygen gas. This forms a bath, which oxidizes quietly in the presence of a considerable excess of oxygen. The metal, maintained constantly in motion by the current of gas, forms continually a colored skin, which gathers round the edges of the bath, and is constantly renewed, as in the cupellation of silver. Without altering the speed of conversion, the heat may be raised much beyond fusion point. These phenomena distinguish completely the conversion of ores rich in silicon from ordinary ores, which, reduced under the same conditions, do not produce the bright and colored streaks. The production of the streaks is due to the dissolution of the hydrogen and of the oxide of carbon in the bath. Again, whilst ordinary ores dissolve a great quantity of these gases, the silicious ores dissolve but traces. MM. Troost and P. Hautefeuille have made some interesting experiments upon the production of artificial silicious pig iron where required. These experiments show that, at a temperature above that of fusion of cast iron, the carbon of the iron freely reduces silica, the carbon exchanging places with the silicon. And, on the other hand, it results that where it is wished to avoid the introduction of silicon into cast iron or steel it should be reduced in vessels of lime or of magnesium. These conclusions appear to be confirmed by the observations of Mr. S. Jordon, who says that to obtain pigs very rich in silicon, it is necessary that the operation in the furnace should be very hot and very slow; the reduction of the silica in the presence of the carbon and of the iron has, under these conditions, the time to take place effectually. It is necessary that the fettling should be very silicious and very aluminous. In spite of this, it must not be forgotten that other causes may intervene to prevent the production of silicious pigs. The reaction of the carbon of the iron upon the silica is slow, and, again, the basic nature of the slags is very little favorable to it. It has, moreover, been established that a silicious pig, melted in lime or in a silicate of lime, loses its silicon. One of the causes of the production of silicious pigs is to be found in the action of the silicates of the alkaline metals, which exist always to a sensible degree in the hearths and fluxes. The influence of the alkaline metals is easy to prove: heat in a wind furnace a mixture of carbonate of potash, charcoal, iron filings and silica; this mixture brought to a high temperature gives a metal containing fifteen or sixteen per cent. of silicon and 2·9 of carbon. This reaction, much more rapid than the former, produces a silicious metal during its rapid descent through the hottest zone of the blast furnace.

A New Furnace at Lebanon, Pa.

Messrs. Kaufman & Co., of Lebanon, are pushing the work upon their new furnace with much vigor. The two hot blast foundations are finished, and brick-laying will be commenced this week. Each oven will contain 40 double pipes, be fitted with combustion chambers and P. L. Weimer's patent gas burners, and, when finished, they will be the most complete structures in the country. The main stack foundation is being rapidly pushed forward, and excavations for the engine, boiler and casting houses have been commenced. The stack will be 16 feet bosh, 55 feet high, made of brick and banded with wrought iron.

Mr. F. J. Obert, of the Union Boiler Works, of Reading, has received the contract for the manufacture of two boilers, to be placed in the new furnace, No. 2. The boilers are in "two nests," each nest containing three upper boilers, 48 feet long, 42 inches in diameter; three lower boilers, 32 inches in diameter by 35 feet long; and two mud drums, 36 inches in diameter by 15 feet long. The upper boilers will be connected with the lower ones by seven pipes, each 12 inches in diameter. A steam dome 20 inches in diameter and 30 inches high is to be secured to each top boiler. The heads of the upper boilers and those for the rear end of the lower boilers will be cast iron. The iron used is to weigh from 11½ to 16 pounds per square foot, and the rivets are to be ⅞ inch in diameter. They are to be finished in 90 days, and will cost $10,000. Very important improvements have been introduced in the design for the boilers, and every advantage taken of the practical experience of the designer, P. L. Weimer. The draft chimneys for the boilers are 36 inches in diameter and 65 feet high, and made of boiler iron.

The engine house is a two story structure, 27x37 feet, is a very imposing building, and is up to the remainder of the buildings in design. The casting house is 85 feet long, 50 feet wide and 30 feet high in the clear, built of brick with iron trussed roof. The designs for the entire furnace have been prepared expressly for the Messrs. Kaufman by the firm of Weimer & Birkinbine, of Lebanon.

Messrs. Weimer & Birkinbine have the blowing engine well under weigh. This will be a vertical engine, and will measure 53 feet from the bottom of the fly-wheel to the top of the blowing cylinder. The large blowing cylinder is now on the boring mill at their works receiving its last cut. It will measure, when finished, 7 feet in diameter; stroke, 7 feet. The steam cylinder will measure 4 feet in diameter; stroke, 7 feet. The engine will weigh 150 tons.

The Iron Age.

New York, Thursday, April 23, 1874.

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JAMES C. BAYLES . . . . Editor.
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CONTENTS.

In response to many requests for copies of the tables showing the cost of pig iron on furnace bank and bar iron at mill, from 1850 to May 1st, 1874, compiled for *The Iron Age* by Mr. Wm. E. S. Baker, Secretary of the Eastern Iron Masters' Association, we have had them reprinted upon heavy Bristol board, 9 by 14 inches, also upon paper, for folding in letters. Copies may be had, without charge, upon application at this office.

The State of Trade.

Earnestly as we have sought during the past few weeks for some indications of a substantial improvement in the condition of the iron trade, we are compelled to confess that we have not found them. As our readers know, we are always disposed to look with hope and confidence upon the future, and we do so even now; but it cannot be denied that the present condition of trade is as bad as it well could be, and that if relief does not soon come in some manner which cannot now be forseen, many failures would seem to be inevitable. Pig iron is in oversupply, and furnaces most favorably located and with an established reputation for their iron, are either piling up their product in the hope of selling it eventually, or standing idle, with no hope of soon resuming operations. For manufactured iron the demand is so limited as to effect no perceptible reduction of stocks in store, and there is no sign of improvement. Labor is discontented with reduced wages, and is assuming a menacing attitude, although we think the men are not so blind as not to see that the threatened "general strike" would be the last straw needed to break the camel's back, and that after such a demonstration as they now propose, the chances of obtaining any employment through the summer would be exceedingly small. There has also been a very general suspension or curtailment of mining operations, owing to the small demand for ores. The trade is now feeling most seriously the effects of the late panic, as the orders which kept the works running for a time have been filled, and no new orders are coming in. Many prominent iron merchants and manufacturers express the belief that no marked improvement can now be looked for until fall, and in such an emergency as this we can only advise our friends in the trade not to take counsel of their fears, but to move cautiously and reduce expenses wherever such reduction is possible. A glance at the statistics of our national development will show that the present depression cannot long continue, unless recovery is retarded by a mistaken policy of financial legislation; but with trade in a worse condition than it has been within the memory of a majority of our iron masters, we do not consider it safe to venture any very hopeful prediction for the immediate future.

It is, perhaps, some poor satisfaction to know that the depression in the iron trade is not limited to the United States, but that it is felt in a greater or less degree in all the iron producing countries of the world. In England the situation is described by a leading iron trade journal as "desperate." British makers are undersold in their own market by Belgian agents, who, for lack of profitable orders from Continental consumers, are selling very cheap in England, where the unreasonable demands of the workmen for wages, altogether disproportionate to the profits of iron manufacture, render it impossible for the masters to take contracts as cheaply as they can be filled in Belgium at the present time. From other parts of the Continent we hear no very cheerful reports, and it is evident that iron masters in all parts of the world will have to content themselves with small profits for some time to come. This condition is probably the natural effect of sudden and sharp reaction from undue stimulation and high prices. The pendulum swung beyond its limit in one direction, and now seems likely to swing as much too far in the other. This may the sooner restore the true equillibrium; but the first effect is to paralyze industry and disorganize commerce. Another year will probably see us entering upon a long and comparatively uneventful period of steady development and moderate prosperty; but it is quite certain that for many years to come skillful management and close economy will be the conditions of success in all branches of iron manufacture, and that the future of this industry depends in a great measure upon our ability to make iron at a price which will enable us to export our surplus production.

Now Give Us Free Banking.

The President has vetoed the currency bill, the long anxiety for a settlement of the currency question has ended in disappointment, and the promise of relief to commerce and manufactures still remains unfulfilled. It is not probable that the bill will be passed over the veto, and the country now looks to Congress for some measure of relief which will be immediate in its benefits and permanent in its operations. What shall this be? We answer unhesitatingly—*Give us free banking.*

As the term "free banking" is used among business men, it does not mean absolute freedom, but freedom to establish as many banks, and to issue as many notes, as the country requires, under the national banking law which requires the deposit of government bonds with the treasurer at Washington to secure circulation, and with some provision for redemption which does not now exist The wants of the merchants and manufacturers of the country are better expressed in Mr. Merriam's bill, reported to the House by the Committe on Banking and Currency on the 29th of January, and then committed to the Committee of the Whole, than in any measure yet proposed. This bill, 1st, removes all existing restrictions upon the volume of national bank notes, and allows their unrestricted issue, based upon deposits of United States bonds; 2d, it requires each bank to keep a deposit of five per cent. of its circulation in legal tenders at the Sub-Treasury at New York for redemptions, in lieu of the present reserve of fifteen and twenty-five per cent.; 3d, it requires the Assistant Treasurer here to redeem in legal tenders all bank notes presented for payment, and return them to the banks from which they emanated; 4th, it does away with the present system of keeping reserves with redemption agents, and requires every bank to keep what reserve it requires in its own vaults. This bill should be promptly passed. It mitigates or reforms all the evils of our present national bank system; it permits the establishment of national banks wherever they are needed; it insures us all the currency we need, and carefully guards against an overissue of currency—which, however, would not depreciate so long as the government bonds are worth ninety per cent. of their face value—by requiring the banks to provide for the redemption of their notes in legal tenders; it would meet the wants of the country without adding a dollar to the national debt; it would give us an abundance of currency without the much dreaded "inflation," and would encounter no serious opposition in any quarter. We call upon the friends of commerce and industry in Congress to push this bill, or one embodying essentially the same provisions, to a prompt consideration and passage. The country needs it, public opinion demands it, and there is no danger involved in the experiment. If new banks are not needed, capitalists will not go into the business; if more currency is not needed, the banks cannot issue it, for no one will borrow it. Three years ago, Hon. Daniel J. Morrell, then representing the State of Pennsylvania in the House of Representatives, urged the claims of freedom of banking upon his colleagues in terms so clear and forcible, and which so well express the views of a large and influential class of merchants and manufacturers, that we quote from his speech to give additional force to what, in the brief interval between the reception of the news of the President's veto and the hour of closing our forms, we have been able to say:

> The only safe means of distributing and regulating the volume of the currency is through local banks which receive deposits and make discounts in accordance with the business requirements of the communities which they serve. Any other way of swelling or reducing the volume of currency cannot be healthful, and its effects must resemble the temporary stimulation of intoxicating drinks and the depression which follows a debauch. The national banks are in successful operation; men of all parties, professions and occupations are stockholders, and their management is free from political or sectional influence. Their officers necessarily have an accurate knowledge of the resources and necessities of the people and possess their confidence. Being independent of the national administration, yet subject to inspection, and liable to forfeiture of privileges which are abused, they are a check upon the treasury, and the treasury a check upon them.
>
> That the banks have made large profits is chiefly owing to causes which have made all money capital productive, and is no evidence of the faults, but rather of the virtues, of the system. Make banking free, and it will cease to be unduly profitable. They will have only such profits upon their business and circulation as can be realized under free competition, money at the same time being plentiful.
>
> This is a common sense, business view of the subject, which commends itself at once to the judgment. We may add, that free banking places no obstacle in the way of a resumption of specie payments, whenever such resumption is possible, and we hope Congress will not delay the earnest and intelligent consideration of the measure an hour longer than is necessary.

Thoughts Suggested by the Recent Disasters at Sea.

Of what advantage are the so called "water tight bulkheads" of our iron steamships? The agents of the various lines lay great stress upon the fact that their vessels are all "compartment ships," and nervous voyagers are assured that it is next to impossible to sink them, no matter what may happen, for if one compartment fills with water the others will float the ships for an indefinite period It costs considerable to put these bulkheads in, they are very much in the way after they are in, and they render no service in strengthening the ships which could not be performed at once better and cheaper with less iron; their only function is to give the ships buoyancy in case of accident, and if they do not do this to an extent sufficient to keep a ship, which happens to spring a leak in one compartment, from sinking at sea, of what possible benefit are they to any one? A few years ago, when the bulkheads were removable, it was not an unusual thing for captains to lay them down in the ships' bottoms and pile cargo on them, or to leave them on shore in some convenient storehouse. Now that they are built in with the ship, they seem to be of scarcely greater utility than when they were left on shore, or utilized as flooring in the hold. The French line has lost two compartment steamers, and nearly lost a third; the Allen line lost seven; the Anchor line lost one a year for several years; the White Star line one; and the Inman line several—we do not now recall just how many. We believe these were all compartment ships, and the question whether these compartments are really useful for anything beyond advertising purposes is, certainly, a very natural one.

Another question of equal importance suggests itself in this connection. If transverse bulkheads do impart additional security to a ship, is not an undue dependence placed upon them, and do not the owners neglect, in consequence, precautions which are indispensable to safety? It would certainly appear so in the case of the *Europe*, which was so insufficiently provided with pumps that the salvage crew from the *Greece* could not keep her afloat, although the water in the hold had only gained one foot in eleven hours, during which time she was left without a soul on board. Of the truth of this assertion there can be no doubt. Salvage crews will take any reasonable risk to save the vessels committed to their care, and they will not leave them while a chance remains of getting them into port. In the case of the *Europe*, Mr. Buck, the officer in command, testifies that he could probably have taken her into port had her pumps been equal to even a moderate service, far below what should have been their minimum capacity. This is a matter which calls for intelligent investigation.

It is useless to call for the enactment of laws for the better protection of life at sea, or to call upon the owners of steamships for reforms of any kind. The only remedy lies with the marine underwriters, and until they are prompted by self-interest to decline taking risks upon vessels which are not as safe and strong as it is possible to make them, more attention will be paid to upholstery and the comfort of passengers than to the means of guarding against disasters at sea. Cheap marine insurance gives us unseaworthy ships, as cheap fire insurance upon land gives us cities which can be swept away in an hour by conflagration. Mr. Plimsol has shown us what appalling abuses have grown up in the British merchant service, as the legitimate result of the willingness of underwriters to insure unsafe ships, and equally courageous investigators would find but little difficulty in showing that the evil effects of this system have spread to all branches of ocean carriage, though the effects are less marked in the cases of the "floating hotels" which ply across the Atlantic, than in those of old and rotten merchantmen sent on distant and dangerous voyages for the purpose of being lost or, as the phrase goes, of "selling them to the underwriters." Mr. Mackenzie, agent of the French line, states that the company will not be pecuniarily affected by the loss of the *Europe* and *Amerique*—supposing at the time that the latter had gone down—although they might be put to temporary inconvenience in finding ships with which to maintain their regular weekly service. As it is, the losses fall upon the insurance companies, and if they are as ready now to write upon steamers insufficiently provided with pumps, upon old side-wheelers lengthened into modern propellers, and upon unseaworthy hulls generally, as they have been in the past, the loss of half the steamers afloat would teach the owners of the other half nothing which would diminish the dangers of ocean travel. Like all evils, that of cheap insurance upon doubtful and hazardous risks will ultimately cure itself through the abuses to which it gives rise; in the meantime we look for but few reforms, so long as the saving of life is the only object to be gained thereby.

The Centennial.

In another column we publish an address to the people of the State of New York, signed by Mr. John Welsh, President of the Centennial Board of Finance, which merits the careful and thoughtful attention of business men. It sets forth that, as nearly one-half of the money needed to carry out the great undertaking has been subscribed, its success is assured; but that it is important to complete the preliminary arrangements at an early day, in order that each State in the Union may be properly represented in the exhibition. The total capital stock of the Centennial, as fixed by Congress in June, 1872, is ten millions. Of this, about four millions have already been raised by public and private subscriptions in Pennsylvania, New Jersey, New York, Delaware, Rhode Island, Arksansas, Virginia, Iowa, Illinois, Indiana, Ohio, Alabama, Wisconsin, Michigan, Missouri, Nebraska, Oregon, Montana, Nevada, Louisiana, Florida, Maryland and California. For reasons set forth at length, the people of New York are asked to assist the work by more liberal subscriptions than they have hitherto made. We hope the appeal will meet with a generous response.

In Congress, the cause of the Centennial is looking up, and the chances are better than ever before for an appropriation of $3,000,000 to nationalize and stimulate the enterprise. On Monday Mr. Kelly succeeded in having the bill appropriating $3,000,000 taken from its place on the calendar and made the special order for May 5th, by a vote which clearly indicates that it will pass when it comes up for consideration. The friends of the Centennial may, therefore, consider that they have won the fight, and that, unless some unforseen obstacle should interpose, the work will go on rapidly to a successful consummation. We hope Congress will not impose upon the commissioners any absurd conditions, or place any obstacle in the way of making the Centennial an international exhibition; but that it will authorize the President to direct our diplomatic agents abroad to use all reasonable means to secure the fullest co-operation of foreign powers. We should, at best, only gratify a petty national vanity by limiting the exhibition to goods of American manufacture or production, while we should lose the benefit which would come from the comparison of our products with those of other nations. Narrow selfishness would prompt us to exclude foreign exhibits: enlightened self-interest would lead us to invite them. Very much of the commercial advantage which may reasonably be expected to result from the Centennial, depends upon the coming of foreign visitors, and if we make it strictly and exclusively national in character, the people of other countries will not trouble themselves to come and see it.

The Smoke Nuisance in Manufacturing Cities.

In many of our Western cities, especially those which consume large quantities of coal for manufacturing purposes, the pollution of the atmosphere by the clouds of smoke continually pouring from the chimneys, is not only an extravagance which must be paid for by the consumers of manufactured products, but an intolerable nuisance as well. Can this waste of fuel—for smoke is only the product of imperfect combustion—be prevented, and the nuisance abated? The question has often been asked and often answered, but in few instances have attempts been made to apply the remedies which have been found successful by experiment. The reason for this is probably found in the popular belief that coal is plenty, and that it is cheaper to waste a little of it than to adopt the appliances needed to insure its perfect combustion in the furnace. Were coal worth only half its present value, the idea that it could be economically wasted—if a term so seemingly contradictory is admissable—would be a mistaken one. Improvements in furnaces are paid for only once—a waste of fuel is a constant tax, which must be added to the cost of production as long as it continues. It is not our intention to discuss the subject at much length, but as it involves the consideration of principles which should receive the careful study of all who make or use stoves and furnaces of every kind, it cannot be without interest to our readers.

It is important, at the outset, to divest the inquiry of an element which needlessly obscures the subject, and leads to erroneous ideas. Smoke and soot arising from the imperfect combustion of fuel never are, and probably never will be, consumed after they are formed. All useful inventions designed to abate the smoke nuisance are simply contrivances for preventing its formation. The first product of a freshly lighted coal fire is not smoke, properly speaking, but a volume of crude, impure coal gas, or fuel in a minutely divided, or diffused, and partly volatilized condition. What is needed, and all that is needed, is to introduce sufficient air among the solid portions and gaseous products of the fuel to effect and sustain perfect combustion, and when this is done the only product will be gases which have no affinity for oxygen and which cannot be consumed. When this is attained the combustion of the fuel will be perfect, and there will be no waste.

It need not be supposed, however, that the introduction of air at the right place and in the right quantity needed to prevent the formation of smoke, is as simple a matter as it would appear at first glance. If it were, the evil of smoky towns and begrimmed populations would long since have ceased to exist, both in Europe and in America. It is not sufficient to supply the furnace with an adequate quantity of air. This much could easily be effected by simply opening the furnace door, and the result of it, so far from suppressing the smoke, would only be to cool the furnace. Hence the introduction of air can not be effected *en masse*, but must be so proportioned and diffused as to become intimately and rapidly mingled with the products of combustion, and this mingling must take place without any reduction of the temperature within the furnace, otherwise the desired result will not be attained. A perfect furnace would be one where the due proportion of air could constantly be admitted at the precise points where the incessant formation and evolution of foul gases was going on. If at every stage of the fire, from the moment of coaling to the time when it becomes bright and clear, only the requisite quantity

of air were admitted, smoke would not be evolved at all.

Experience, however, has shown that by no invention yet applied can the formation and diffusion of smoke be wholly prevented, although in some places a near approximation to this desirable result has been reached. The most successful of the manifold inventions for suppressing smoke, appear to be those which introduce the atmospheric air by numerous small apertures at the bridge of the furnace, so as to diffuse it in streams and jets among the gases before they ascend the chimney flue. With such devices, however, quite as much depends upon the skillful management of the fire as upon the machinery employed. To obviate the evils resulting from inattentive firemen or stokers, some patents supply the fuel to the furnace by machinery; the grate being also made to revolve, is thus kept constantly supplied with an even layer of fuel. Being self-feeding, it requires no skill on the part of the fireman, who has merely to fill a large hopper with coals two or three times a day. This invention has been measurably successful, but the very regularity of its mechanical action is sometimes a serious disadvantage, because it prevents the fireman, in case of an emergency, from urging his fire, or creating "high pressure." It also requires that the furnace should be very large, and that there should be a surplus of boiler room. It can be adapted to few furnaces already built, and its expense is, therefore, a serious drawback.

This subject offers an inviting field for investigation and experiment, and whoever shall succeed in doing what the many inventors who have obtained patents have failed to accomplish, or accomplished only in part, will reap a profit that will more than compensate for the time and labor expended. The gas generated by a ton of bituminous coal measures about ten thousand cubic feet, and it requires about ten times its volume of atmospheric air (or one hundred thousand cubic feet), while the coke portion of the same ton of coal will require a further amount of two hundred thousand cubic feet of pure air, in order to effect its complete consumption. How to supply this air, as, and when, it is needed, is the question for which our furnace builders have hitherto failed to find a satisfactory answer. We incline to the belief, however, that were smoky chimneys declared public nuisances, and coal consumers required by local ordinances to abate that nuisance, a means would soon be found for so doing, to the permanent advantage of all classes of the communities now required to breathe smoke impregnated air.

New Publications.

THE APPRENTICE, OR FIRST BOOK FOR MECHANICS, MACHINISTS AND ENGINEERS. By OLIVER BYRNE, NEW YORK. A. J. FISHER, pp. 207.

This little volume, which is printed in excellent type, on good substantial paper and neatly bound in boards, supplies the want so long felt of a thorough elementary treatise on practical mechanics.

To understand the so called elementary treatises on the theory and application of mechanics, used in our schools and colleges, requires a greater amount of mathematical knowledge than is usually possessed by artisans, and even when the information contained in them is acquired, it is seldom of much value to the practical man. Mr. Byrne's book, unlike those more elaborate and abstruse works, embodies all the information necessary in an elementary work of this nature in a practical, concise and comprehensible form. The system pursued is inductive and simple, the illustrations perfectly clear, and the explanations which accompany them unusually lucid. It is too frequently the practice to encumber works of this nature with unnecessary verbiage and roundabout explanations which only serve to confuse the student. This common defect is most adroitly avoided in the present volume, the instruction contained in it being always conveyed in intelligible and brief terms. We regard it as a most serviceable contribution to the literature of mechanics.

Our Foreign Trade in Iron, Metals and Manufactures thereof.

The forthcoming report of the Bureau of Statistics for December, 1872–1873, and the calendar years ended therewith, makes the following showing of imports of metals into the United States for the two years:

	1872.	1873.
Brass, and manufactures of..	343,469	191,237
Copper, and manufactures of	2,411,759	3,116,490
Iron, pig	5,181,847	7,269,850
Iron castings	19,169	38,564
Iron, bar, boiler, band, hoop, scroll and sheet	6,153,564	6,903,146
Iron rails	4,708,189	14,498,012
Machinery and other manufactures of iron	3,681,722	2,908,701
Steel, ingots, bars, sheets and wire	3,865,316	4,106,087
Steel railroad bars	8,984,103	8,207,013
Steel, manufactures of	10,109,901	10,169,391
Lead, pigs and bars	2,561,035	3,172,034
Metals and metal compositions	1,190,547	913,652
Tin, in bars, blocks and pigs	3,048,396	1,317,357
Tin, in plates	14,240,868	13,893,450
Zinc, spelter, and manufactures of	794,412	1,303,938

The exports of iron, steel, metals and their manufactures for the years 1872 and 1873 were published in our issue of April 2 from advance sheets furnished us by Dr. Young.

The following are the total values for the year ended December 31, 1873, as compared with 1872:

	Imports.	Domestic exports. (specie values.)	Foreign exports.
1873	$624,997,362	$606,366,531	$24,968,204
1872	677,144,579	544,438,789	25,086,083

Classified as follows:

	Imports.	Domestic exports. (specie values.)	Foreign exports.
1873.			
Specie & bul'n.	$29,749,439	$56,263,496	$7,308,892
Merchandise...	595,247,923	550,103,039	17,659,312
1872.			
Specie & bul'n.	21,182,004	92,205,236	8,391,688
Merchandise...	655,962,575	452,143,553	16,694,395

1873.	Imports.	Foreign exports.
Free	$171,222,761	$10,814,120
Dutiable	453,774,601	14,154,084
1872.		
Free	115,275,436	10,478,186
Dutiable	561,869,143	14,607,897

Allowing for the difference in the warehouse accounts, the exports for the calendar year 1873 are in excess of the imports by $289,531, while for 1872 the imports exceeded the exports by $108,473 713.

The New Canadian Tariff.

The following is an abstract of the new Canadian tariff which went into effect on the 15th inst.:

Goods paying 10 per cent. ad valorem.—Locomotive engine frames, axles, cranks, hoop iron or steel for tires of wheels, bent and welded crank axles, piston rods, guide and slide bars, crank pins and connecting rods, machinery for mills and factories which is not manufactured in the Dominion.

Goods paying 5 per cent. ad valorem.—Ships' materials, viz.: Binnacle lamps, blocks and patent bushes for blocks, bunting, cables, iron chain of all sorts, compasses, dead eyes, dead lights, deck plugs, knees, iron masts or parts of, iron pumps and pump gear, riders, iron shackles, sheaves, signal lamps, steering apparatus, traveling trucks, wedges, wire rigging, cables, hemp or grass cordage, sail cloth or canvas, varnish, black and bright iron scraps, galvanized or pig, bars, blooms and billets, puddled or not puddled, bolts and spikes, galvanized wire, steel wrought or cast in bars and rods, steel plates cut to any form, but not molded; copper in pigs, bars, bolts, and for sheathing; yellow metal in pigs, bars, and for sheathing.

Goods paying 7½ per cent.—Iron in bar, hoop, rod and sheet, nail and spike, rod, round, square and flat, Canada plates and tinned plates, rolled plate and boiler plate.

Scientific and Technical Notes.

There has lately been on exhibition in Chicago

A CURIOUS STEAM ENGINE,

invented by Mr. E. A. L. Roberts, of Titusville, Pa. It is described as follows: The peculiarity of Mr. Roberts' invention consists in having a double exhaust cylinder, the main escape of the exhaust steam being in the middle. The cylinder is constructed with a circular part, or slot, around the middle, the piston head being one half as long as the cylinder, less the width of the circular part or slot. It will be seen that when the piston head is at one end, and steam is admitted to force it to the other end of the cylinder, that the full pressure of the steam is held until the piston has done its work, when the exhaust steam is allowed to escape all around the cylinder, instantly increasing an almost perfect vacuum. The full force of the steam is employed, or, in other words, the steam does not "let go" until the piston has accomplished its full stroke. For instance, in a locomotive engine, 17x22, with the link in a certain position, in which the valve travels 2 2-16 inches, the live steam is cut off at three inches of the stroke, the steam commences to exhaust, forward and back, at 11 4-16 inches, leaving ten inches of space for the piston to move under a constantly diminishing force of steam. In the case of the central exhaust, which has a capacity about nineteen times larger than the other for disposing of the exhaust steam, the full power of the live steam is exerted the entire length of the stroke upon the piston head. The cylinder may be placed either vertically or horizontally, and if in the latter position, the central part affords an excellent opportunity for the water arising from condensed steam to escape without the use of cocks. Another important feature in Mr. Roberts' invention is the fact that the piston head, being long, has a better bearing upon the cylinder, and, of course, is less liable to wear than any other. By thus using the full power of the steam a less amount can be employed, together with a smaller cylinder, to produce a given power, which results in a saving of at least twenty-five per cent. in the fuel used. The motion being quicker by reason of the instantaneous exhaust, and the application of full power of the steam up to the instant of exhausting, the engine can be reversed, when running at a high rate of speed, with little danger, even with one cylinder, of striking the dead center; and in the trial recently, when the balance wheel was making 1000 revolutions a minute, the cut off was thrown back and forth, apparently hardly checking its velocity in changing its direction.

In a recently published essay on "The Use of Coke in Blast Furnaces," Ringel undertakes to show that

SMALL CHARGES IN BLAST FURNACES

are better than large ones. In a given case, other circumstances being the same, and the production the same, a small charge remains in the furnace three hours longer than a large one, and hence is longer exposed to the action of the gases, while the alternation of charges is twice as rapid, and thus the temperature of the carbureting and reducing gases lying above the zone of fusion is reduced, which causes a more perfect preparation. Beside, small charges possess the following adventages: *a.* The action of the ascending current of reducing gases is more intense because the hight of the column of ore is actually less. *b.* The rapid succession of charges, and consequent lower temperature, prevents their fusing together so as to form bridges and thus suspend the charge. *c.* The fuel is more completely used, for, by its broader distribution, a larger surface is offered to the air blast. *d.* Owing to the more intimate mixture of fuel and burden, the injurious constituents of the burden soon come into contact with such materials as will prevent their exerting an injurious influence on the product. *e.* Since this rapid alternation of charges prevents a high temperature in the portion of the furnace above the zone of fussion, it also decreases the injurious action of the sulphur given off from the fuel. The sulphur passing upward over the layer of ore meets with iron which is already sufficiently carbonized, so that it can only decarbonize it to a certain extent, without replacing the carbon entirely, as would be possible with iron but slightly carbonized. *f.* The low temperature of the upper part prevents the reduction of silicon.

In choosing large charges, especially of fuel, there has been a cardinal error, which, in spite of the alleged valuable increase in the heat of the furnace with large charges of fuel, has exerted the greatest influence on producing unsatisfactory results. In general, if 17 to 20 cwt. of coke be taken for a charge, as is customary in well managed furnaces, it is easy to prove that the results are far more satisfactory than when twice as much coke is used.

Frequently the broadest section of the furnace (at the boshes) is taken as the basis for calculating the volume of the charge of fuel, which is required to be such that when spread out in this section it shall still be thick enough (some metallurgists say 4 inches) to prevent the ore above from rolling through, whereby all would get too much mixed up in the lower part. This determination of the size of the charge, according to the section of the boshes, gives an unsafe result, since the different density of the coke never permits charging by weight, but always by volume. Charging fuel by volume, although admissable now and then, is absolutely useless.

As already remarked, small charges produce a stronger carburation of the iron, and hence it takes up sulphur from the fuel ash with more difficulty. Lime has a similar effect; it renders the charge less fusible, delays the descent of the charge, the carburation is greater, and the iron takes up less sulphur. When the fuel contains much sulphur, high carburation must be aimed at, for the more sulphur the iron takes up before fusion the less carbon it will contain.

M. Mayer, an electrician of Paris, has perfected the system of

CHIROGRAPHIC TELEGRAPHY

by the invention of an instrument which transmits a message in the handwriting of the sender. The message is written on metallized paper—*i. e.*, paper which has a sufficient metallic surface to conduct electricity, and that the writing fluid used must be a non-conductor. The metallized paper is wound round a cylinder, termed the transmitting cylinder, which moves with great regularity, and is insulated. Close to it is a micrometer screw, carrying a nut or slide, which, by the revolution of the screw, moves in a direction parallel to the axis of the cylinder. The slide carries a metallic brush and a style, which are insulated from each other and constantly rub against the surface of the paper. The parts are so geared and proportioned, that at each revolution of the cylinder the style moves one-fourth of a millimetre. Every portion of the surface of the paper, therefore, comes successively into contact with it, and into electric communication with the earth with which it is connected. At the transmitting station the positive pole of the line battery is connected not only with the line, but also with the metallic brush. The battery circuit is constantly closed, and the distribution of the current depends upon the position of the style. When its tracing point touches the metallized surface of the paper, the battery current takes the course of least resistance, passing through the brush, over the paper, to the style, and thence to the earth. In this case only a derived current passes through the line. But when the style is on any letter of the message, then as this letter is written with a non conducting ink, the short circuit is open, and the battery current is sent in its entirety through the line wire. So much for the transmitting part; but each apparatus is also provided with a receiving instrument, so that a *fac simile* of the telegram is produced at each station. Around the cylinder of this instrument a triangular metallic thread is so wound that the helicoidal figure it forms shall describe one convolution round the cylinder. This thread constantly rubs against an ink roller, and makes on the receiving paper a series of short lines which gradually become complete, and thus form the letters of the message. If we suppose the strip of paper upon which the despatch is to be autographed to be supported against and thus remain in contact with the helix of the cylinder, we shall at once perceive that this inked metallic thread will trace a straight line across the paper. On the completion of this line a second will be traced parallel with it, and so on. From this the necessity of breaking contact, or, in other words, of withdrawing the paper, will be apparent. The interruption is obtained in the following manner:

On the side of the cylinder, opposite to the inking roller, is a vibrating quadrangular frame, the ends of which extend beyond those of the cylinder and rest on pivots, so as to balance it on its longitudinal axis. A very slight elevation of that edge of the frame which is toward the cylinder, serves to bring the paper which is supported by the frame, in contact with the inked surface of the helical metallic thread; a depression equally slight withdraws it. The movement, which is almost instantaneous, is produced by an electro-magnet attached to the frame on the underside. Its poles, which are in opposition with those of a fixed permanent magnet, are, by their changing magnetism, alternately attracted and repelled. The current which produces this motion in the frame, and consequently the letters of the message on the paper, does not proceed from the sending station, but from a local battery, connected with a relay. This relay consists of a fixed steel magnet and of an electro-magnet, the core of which is in proximity to the poles of the permanent magnet.

The synchronism of the two instruments is established and maintained during transmission by concealed pendulums with very heavy lobs, and the transmitted message is reproduced in exact *fac simile*. The instruments are already in use between Paris and Lyons, and although comparatively slow, there working in other respects is entirely satisfactory.

Dr. J. P. Joule has lately conducted a series of interesting experiments to determine the

EFFECT OF COLD ON IRON AND STEEL.

The following is a translation of his account of the result reached:

1. A mixture of snow and sea salt having been placed upon a table, iron and steel wires were stretched in such a manner that a portion of their length was engaged in the freezing mixture, while the rest was free from it; in each case the wires experimented upon broke outside the cold mixture, the temperature of which was 12° C.

2. Twelve needles of good quality, about three inches long and 1-24 inch in diameter, were fixed firmly by their two ends at two inches distance from each other; a wire was then fastened by one of its ends to the middle of each needle, and attached at the other end to a machine for measuring the power of springs. The machine was then set in action until each needle broke. Six of the needles taken at hazard were tried at the temperature of + 13° C, and the six others in a freezing mixture, which reduced their temperature to − 11° 11 C; in the former case, five of the needles broke with forces varying from 1·134 to 1·842 kilogrammes, the sixth bearing 1·701 without breaking; in the latter case, five broke under forces varying from 1·134 to 2·041 kilogrammes, while the sixth bore a strain 1·701 without breaking. The result is curious, the lowest breaking point being identical in the two cases, while the highest occurred when cold was applied. Comparing the totals the averages are as follows: At ordinary temperature, 1·637; at − 11° 11', 1·801 kilogrammes. M. Joule had previously tried the elasticity of all the needles, and could find no difference between them.

3. It having been stated that the violent action to which a railway wheel tire is exposed resembled an active power rather than mere pressure, and, further, that cast iron was supposed to be more affected by cold than wrought iron or steel, M. Joule made an experiment of a different kind. He procured a number of cast iron nails, 1¼ inch long, and about ⅛ inch diameter in the middle, and having selected those of which the weights were as nearly as possible the same, he arranged each nail in such a way that a cutting hammer, weighing 5¼ lb., fell from a fixed hight on the middle of the nail, which was supported at each end. In order that the test should be as sure as possible, the nails were taken at hazard, and the trials with the cold nails alternated with those at the ordinary temperature. The nails were chilled by being plunged in a freezing mixture, and were struck with the hammer within five seconds of being taken out. Twelve series of these nails were experimented on, each series comprising sixteen nails, those which were not broken being added to the following lot. The results were as follows: Three series were tried at the ordinary temperature, being + 2° 22° C., the cold being increased from −12° 22° to −16° 67°, and the fall of the cutting bit from twenty to thirty inches, and only one of the cold nails broken. In the fourth case the temperatures being the same, but the fall increased to thirty-five inches, two cold and one of the other nails were broken. In the fifth experiment, the fall being increased to 39½ inches, one of each of the eight nails was broken. In the sixth experiment the cold was increased to 17° 78°, with the same ordinary temperature, and the same fall of the cutter, and one of each eight again broken. In the seventh, the fall was raised to nearly forty inches, when only one of the cold nails was broken. In the next two experiments, the ordinary temperature was + 4° 40°, and artificial cold, 16° 67°; when, with a fall of fifty nine inches, two cold and one other nails were broken; and, with a fall of seventy-five inches, three of each. Ten of the same nails were then tried at the same temperatures, with a fall of eighty-five inches, when two cold and one other nails were broken. The six remaining nails were then tried, three at the temperature of + 4° 44°, and three at 16° 11°, with a fall of ninety-eight inches, two only of the cold nails and three of the others being broken. Finally, an experiment was tried with fresh nails, twelve of which had been kept for four hours, at a temperature of − 16° 11°, the ordinary temperature being + 5°, and the fall seventy inches, the result being the breakage of seven of the frozen and eight of the other nails broken. Total broken—twenty-two of the frozen nails and nineteen of the others.

Taking the whole of the above experiments into consideration, M. Joule arrives at the conclusion that frost or lowering of temperature does not render cast iron, wrought iron, or steel more liable to break, and that the accidents which happen on railways arise from the negligence of the companies in not submitting their wheels, axles, and all the other parts of their rolling stock, to practical and sufficient test before using them in the service of the line.

A communication lately read before the *Academie des Sciences*, on the subject of

SILICON IN PIG IRON,

claims that, instead of being an impurity, it is one of the indispensable elements in cast iron intended for conversion into steel by the Bessemer process. By combustion in the converter, silicon, we are told, develops three times as much heat as the same weight of carbon. Ores rich in silicon thus effect a great saving in fuel, and by maintaining a high temperature, produce a more excellent conversion into steel. A. M. H. St. Claire-Deville employs a special method of making pig iron containing a large percentage of silicon, which insures excellent results. The silicious pig is brought to a condition of fusion in a crusible of quick-lime, upon a hollow spindle fed by a stream of ordinary coal and oxygen gas. This forms a bath, which oxidizes quietly in the presence of a considerable excess of oxygen. The metal, maintained constantly in motion by the current of gas, forms continually a colored skin, which gathers round the edges of the bath, and is constantly renewed, as in the cupellation of silver. Without altering the speed of conversion, the heat may be raised much beyond fusion point. These phenomena distinguish completely the conversion of ores rich in silicon from ordinary ores, which, reduced under the same conditions, do not produce the bright and colored streaks. The production of the streaks is due to the dissolution of the hydrogen and of the oxide of carbon in the bath. Again, whilst ordinary ores dissolve a great quantity of these gases, the silicious ores dissolve but traces. MM. Troost and P. Hautefeuille have made some interesting experiments upon the production of artificial silicious pig iron where required. These experiments show that, at a temperature above that of fusion of cast iron, the carbon of the iron freely reduces silica, the carbon exchanging places with the silicon. And, on the other hand, it results that where it is wished to avoid the introduction of silicon into cast iron or steel it should be reduced in vessels of lime or of magnesium. These conclusions appear to be confirmed by the observations of Mr. S. Jordon, who says that to obtain pigs very rich in silicon, it is necessary that the operation in the furnace should be very hot and very slow; the reduction of the silica in the presence of the carbon and of the iron has, under these conditions, the time to take place effectually. It is necessary that the fettling should be very silicious and very aluminous. In spite of this, it must not be forgotten that other causes may intervene to prevent the production of silicious pigs. The reaction of the carbon of the iron upon the silica is slow, and, again, the basic nature of the slags is very little favorable to it. It has, moreover, been established that a silicious pig, melted in lime or in a silicate of lime, loses its silicon. One of the causes of the production of silicious pigs is to be found in the action of the silicates of the alkaline metals, which exist always to a sensible degree in the hearths and fluxes. The influence of the alkaline metals is easy to prove: heat in a wind furnace a mixture of carbonate of potash, charcoal, iron filings and silica; this mixture brought to a high temperature gives a metal containing fifteen or sixteen per cent. of silicon and 2·9 of carbon. This reaction, much more rapid than the former, produces a silicious metal during its rapid descent through the hottest zone of the blast furnace.

A New Furnace at Lebanon, Pa.

Messrs. Kaufman & Co., of Lebanon, are pushing the work upon their new furnace with much vigor. The two hot blast foundations are finished, and brick-laying will be commenced this week. Each oven will contain 40 double pipes, be fitted with combustion chambers and P. L. Weimer's patent gas burners, and, when finished, they will be the most complete structures in the country. The main stack foundation is being rapidly pushed forward, and excavations for the engine, boiler and casting houses have been commenced. The stack will be 16 feet bosh, 55 feet high, made of brick and banded with wrought iron.

Mr. F. J. Obert, of the Union Boiler Works, of Reading, has received the contract for the manufacture of two boilers, to be placed in the new furnace, No. 2. The boilers are in "two nests," each nest containing three upper boilers, 48 feet long, 42 inches in diameter; three lower boilers, 32 inches in diameter by 35 feet long; and two mud drums, 26 inches in diameter by 15 feet long. The upper boilers will be connected with the lower ones by seven pipes, each 12 inches in diameter. A steam dome 20 inches in diameter and 30 inches high is to be secured to each top boiler. The heads of the upper boilers and those for the rear end of the lower boilers will be cast iron. The iron used is to weigh from 11½ to 16 pounds per square foot, and the rivets are to be ¾ inch in diameter. They are to be finished in 90 days, and will cost $10,000. Very important improvements have been introduced in the design for the boilers, and every advantage taken of the practical experience of the designer, P. L. Weimer. The draft chimneys for the boilers are 36 inches in diameter and 75 feet high, and made of boiler iron.

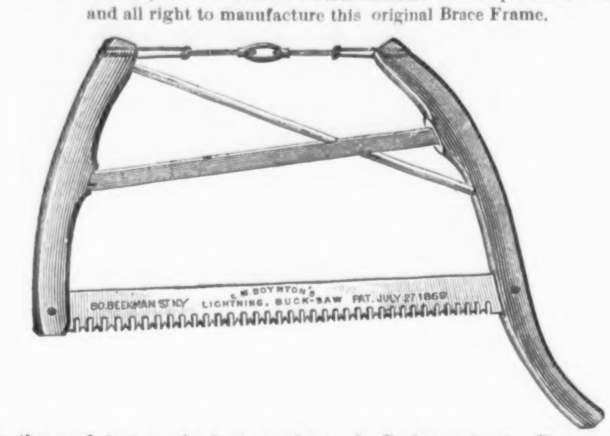
The engine house is a two story structure, 27x37 feet, is a very handsome building, and is up to the remainder of the buildings in design. The casting house is 80 feet long, 50 feet wide and 30 feet high in the clear, built of brick with iron trussed roof. The designs for the entire furnace have been prepared expressly for the Messrs. Kaufman by the firm of Weimer & Birkinbine, of Lebanon.

Messrs. Weimer & Birkinbine have the blowing engine well under weigh. This will be a vertical engine, and will measure 53 feet from the bottom of the fly-wheel to the top of the blowing cylinder. The large blowing cylinder is now on the boring mill at their works receiving its last cut. It will measure, when finished, 7 feet in diameter; stroke, 7 feet. The steam cylinder will measure 4 feet in diameter; stroke, 7 feet. The engine will weigh 150 tons.

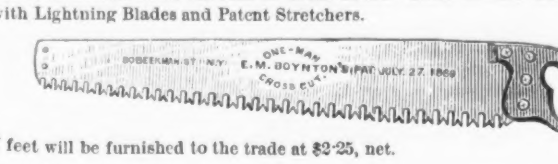
Lightning Saw Tooth; two Points Dressed to Cut in Line on one side of Kerf and two on the Other.

Our Frame Factory is at Present Running Exclusively on this Frame.

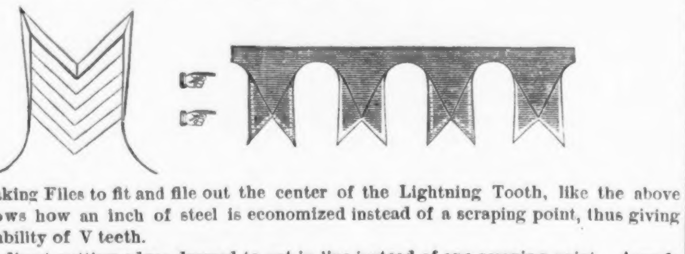
It is made of the best stock, and in the most careful manner. I have purchased all the patents and all right to manufacture this original Brace Frame.



Fifteen thousand just received at warehouse in Beekman street. They are much better finished than heretofore, and guaranteed equal to any Braced Frame in the market. My purchased patents ante-date all other varieties of Cross Brace. Price to the trade, $10 per dozen, complete with Lightning Blades and Patent Stretchers.



For 3½ feet will be furnished to the trade at $2·25, net.



We are making Files to fit and file out the center of the Lightning Tooth, like the above cut which shows how an inch of steel is economized instead of a scraping point, thus giving thrice the durability of V teeth.

Note, two direct cutting edges dressed to cut in line instead of one scraping point. Awards have been made in 1872, American Institute Fair, New York, special medal of award over all other manufacturers. 1873, silver medal, the highest award voted over all.

Since the date of my first patent, Nov. 27, 1866, several of the large saw manufacturers, after opposing, ridiculing and endeavoring to crush out my Lightning Saws, have at length paid me the tribute of imitating my goods and infringing upon my patents. They can sell inferior goods at lower prices, and there is no excuse for their breaking the laws of the country, and seeking to rob inventors of their hard-earned rights and property. The fact that these men have amassed millions from patent machinery and inventions of others, gives them no right to use such gains to rob and oppress inventors. The Government did not protect their patents, nor the people render them their wealth for any such purpose. Believing, as I do, that right will triumph in the end, I am pushing my cause in the United States courts of equity to a speedy, and, I trust, successful conclusion, so that a single suit may settle the question for all persons who make, sell, or use my goods in defiance of patent law. But even if sure retribution does not always follow the criminal, what high-toned merchant wishes to sell infringements knowingly? The public conscience must support the right, or law is valueless, and the rights of the lofty and lowly have alike one foundation. NO MAN CAN AFFORD TO DO WRONG.

Wealthy saw manufacturers may pay legal costs, but cannot shield the consciences of their customers, and the meanness of a wrong is increased by chances of escaping detection and punishment.

For the information of the public, I submit the following letter of my Attorney, which explains itself:

E. M. BOYNTON, Esq., 80 Beekman street, N. Y.

DEAR SIR: We have received your letter asking our opinion as to the validity of the claims in your Re-issue Letters Patent, No. 3566, for the **M** shapped cutting teeth described therein. Your original Letters Patent, No. 59,951, dated November 27, 1866, contain the said invention and consequently the Re-issue was legally and properly granted.

The invention referred to is secured by the first and second claims, and in our opinion both said claims are valid. The first is, in substance, for the **M** shaped tooth provided with cutting faces.

The second claim covers such a tooth having its cutting points dressed to cut in line on the same side of the kerf, and so on with each succeeding tooth, successive teeth cutting on opposite sides of the kerf from each other, but the cutting points of each tooth are dressed to cut on one side only of the kerf.

The said claims are, in our opinion, good and valid, and any persons making, selling or using the devices and constructions specified therein without license from you, are infringers of your Patent and are liable to suit, since the Patent was properly granted, and no anticipation of the improvements above referred to has been found, so far as we are aware, which cast any doubt upon either of said claims, or upon the correctness of the action of the Patent Office in granting the same. Yours, truly,

VAN STANVOORD & HAUFF, Solictors of Patents, 41 Park Row, N. Y.

B. F. BUTLER, Washington, D. C.

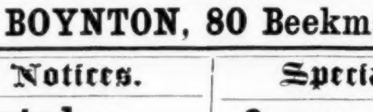
ANSWER TO HENRY DISSTON.

The reason no one can take my $500 TEST Challenge, is manifest when on the 25th page of last week's issue of this paper, we find, that if any one will conceal a **V** obstruction between points of my Patent **M** tooth, a "saw will cut four times as fast," as if its points were all of the old **V** teeth.

Henry Disston stakes his reputation on this recommendation of my goods.

If an adulterated Lightning (dubbed Great American) "will cut four times as fast as the common tooth" used by other Saws, what, then, will my genuine Patent Lightning do?

"If such the sweetness of the stream,
What must the fountain be."



I shall be ready, on proper notice, to accept a challenge from any saw manufacturer, and am ready to back my words with appropriate deeds and $500 expense, if beaten.

E. M. BOYNTON, 80 Beekman st., N. Y.

Special Notices.

Wanted.

Having sold out my interest in the Hardware business, I am now wanting a position as traveling salesman in some first-class hardware, Iron or Manufacturing establishment. Can give the best of references. Address,

FRED. C. SHAYS, Humboldt, Kan.

Situation Wanted

By a young married man, as salesman in a wholesale or retail hardware store; has had seven years' experience. Speaks English and German. Can give best of reference. Address, **HARDWARE, Box 709, Elkhart, Ind.**

Wanted.

A young or middle aged, active and energetic partner, with $6000 to $7000 capital, in an old established and well paying retail Hardware business, situated in one of the most thriving towns in Western New York. Satisfactory reasons given. Best of references given and required. Address, **S**,

Office of *THE IRON AGE*, 10 Warren St., N. Y.

R. T. HAZELL, AUCTIONEER.

By R. T. Hazell & Co.,

Store No. 94 Reade Street.

Our REGULAR SALES of HARDWARE, CUTLERY, FANCY GOODS, &c., will be held on TUESDAYS and FRIDAYS throughout the season.

CASH ADVANCES made on CONSIGNMENTS without additional charge.

Special Notices.

Commercial Travelers, ATTENTION!!

Odd Hours made Profitable.

Those having trade with dealers in Hardware, Tin and Stoves, House Furnishing Goods and China, also with Confectioners, Hotels or steamers, in any part of the United States and Canadas, can hear of a good selling article (complete outfit, eight ounces, sent by mail. No sample required), by addressing with good references, and stating location of trade.

Philadelphia P. O. Box, 2130.

Next July a well known firm of Engineers and Machinery Agents, with large connections at home and abroad, will open a ground floor warehouse, having windows fronting Queen Victoria Street and Cannon Street, London, E. C. The firm is prepared to accept the agency for special machinery, tools, &c., and to exhibit a choice selection of these, and of working models. Advertisers' travelers canvass Great Britain and the whole of Europe. For terms, apply to *W. P. L., Office of The Iron Age*, No. 10 Warren Street, N. Y.

Special Notices.

Wanted.

A traveling salesman who is thoroughly familiar with the Hardware business, and can bring satisfactory reference. One acquainted with the New England trade would be preferred. Address,

P. O. Box 1997, New Haven, Conn.

A Manufacturing Company,

Employing traveling agents, is desirous of securing the agency of some articles of Heavy Hardware to be sold in connection with their own Manufactures. Address, **A. B.,**

Office of *The Iron Age*, 10 Warren St., N. Y.

$14,500 Cash,

will buy a new brick store, 90 feet deep, iron and plate glass front, finished in hard woods, two stories and basement, with a splendid assortment of hardware, $4000 less than actual worth. Books show a profit of $5000 per year. Proprietor has other business. Address, **S. J. T.,**

Office of The Iron Age, 10 Warren St., N. Y.

Established 1859.

H. R. IVES & CO.,

Successors to IVES & ALLEN,

Manufacturers of

Builders' and House Furnishing HARDWARE.

Also Manufacturers' Agents.

Having a most extensive connection throughout the Dominion, and keeping a number of first-class salesmen upon the road all the time, we can offer superior inducements to American manufacturers for placing their goods in this market.

Consignments of American Hardware solicited. N. B.—Sales confined to the jobbing trade.

Address, **H. R. IVES & CO., Montreal, P. Q.**

A man with over 20 years' experience in the manufacture of Iron, a thorough, practical draughtsman, Civil and Mechanical Engineer, at present in charge of the construction of a blast furnace in the South, will be open to engagement shortly. Address, *IRON MASTER*, *Office of The Iron Age*, No. 10 Warren Street, N. Y.

Katahdin Charcoal Pig Iron.

O. W. DAVIS, Jr. Manufacturer, **Portland, Me.**

Furnace in Piscataquis County, Me., for Car Wheels, Steam Cylinders, Boiler Plates, Hydraulic Presses, Plows, Chilled Rolls, and any purpose requiring great strength.

South Boston Tests, Katahdin Pig Iron.

No. 2, density, 7·2002; tensile strength ℔ square in., 19,894
No. 3, " 7·2432; " " " 26,928
No. 4, " 7·2305; " " " 30,765

Shipped by rail or water from Bangor or Portland. Samples and analyses furnished on application.

MANUFACTURERS

desirous of introducing their goods to the **British** and **Continental** Markets, are advised to insert advertisements in the newspaper "**IRON**," published every Saturday, at *99 Cannon Street, London, E. C.*

SCALE: First 3 lines, 3/; every additional line, 10d Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

A. PURVES & SON,

Corner South & Penn Streets, Phila.,

Dealers in

Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.

Cash paid for all kinds of **Metals** and **Tools.**

STERLING IRON & RAILWAY CO.

SHIPPERS OF

STERLING MAGNETIC IRON ORE

FOR BLAST AND PUDDLING FURNACES.

A. W. HUMPHREYS, Treas.,
42, PINE ST., N. Y.

To the Trade.

HARDWARE TRADE REGISTER.

1874

Owing to the backward state of trade occasioned by the late panic, we have deemed it advisable to defer the issue of our Trade Register until a later period than usual in order to give its benefits to the trade of next season.

It having come to our knowledge that certain parties, evidently having no reputation of their own, are endeavoring to trade upon our already established reputation, by assimilating our title, and even, in some instances, from what we understand, using our last edition for canvassing purposes, we respectfully anounce to the trade that we are now canvassing for our next edition, which will contain additional features of interest calculated to make it still more valuable than it already is, and render it indispensable as a work of reference to the trade, **and we ask them to withold their advertising favors until our agent may call upon them.**

Please Notice that we always have a printed form, bearing our address 4 & 6 Warren St., for orders for advertisements, and that they are payable only to the order of the Manager.

The Merchants and Manufacturers Agency,

(MERCANTILE.)

No. 4 & 6 Warren St., N. Y., ublisher.

CAUTION

No advance payments required for regular advertisements; but **all small matter is payable in advance.** And our only authorized agents to collect money are invariably provided with a certificate of authority, bearing our official seal, and signed by the manager, and are instructed always to give our printed receipt stamped with our seal and countersigned by the party receiving the money.

S W THOMPSON, Manager.

TO INVENTORS.

Patents secured in the United States and Europe, on the lowest terms and very

PROMPTLY,

by **A. V. BRIESEN,** Solicitor of Patents and Attorney at Law in Patent Cases. **258 Broadway, N. Y., cor. Warren St.** Consultation gratis.

Special Notices.

Wanted,

An equal partner with $10,000 or $15,000 to commence the manufacture of a recently patented Car and Wagon Spring, the lightest, best and cheapest Elliptic Spring made, corroborated by Railway Officials, Supply and Spring Dealers. Sale positive. Inventor prefers to take entire charge of manufacture, outside business, also, if desired. Full particulars by addressing, **J. E. JEFFREY,** 263 Pacific St., Brooklyn, N. Y.

A gentleman who has been traveling in the South for eight years past, for an English cutlery and hardware house, and who is thoroughly acquainted with the hardware, house-furnishing and notion trade from Baltimore to San Antonio, Texas, desires to make a new engagement. Address, with particulars, *J. W. S., Office of The Iron Age, 10 Warren Street, N. Y.*

WM. E. TANNER & CO.,

Metropolitan Works.

Manufacturers of

Steam Engines, Boilers and other MACHINERY,

Canal St., from 6th to 7th, Richmond, Va.

In addition to a full line of new engines, boilers, saw mills, and other machinery of our own manufacture, we have now on hand and will sell at very moderate rates, the following lot of **second-hand machinery**, viz.: 3 Double Hoisting Engines, suitable for mining, tunnelling or other purposes. Each of these engines has two cylinders, 7½ in. diam. by 18 in. stroke; two drums, 4 ft. diam. by 4 ft. long; geared to engine in proportion of 8 to 1, and are provided with disconnecting gear and friction brakes.

One 150 Horse-Power Stationary Engine, with heavy fly wheel, all complete, and nearly as good as new.

Three Return Tubular Boilers, (70 three inch tubes each), 15 feet long, complete with steam drum, fronts, valves, grates, &c., suitable for the above engine.

One 10 Horse-Power Portable Engine of our own make, complete, with two driving pulleys, "Judson" governor, &c., nearly new, and in excellent order.

One 30 Horse-Power Portable Engine, with circular saw mill, saw and belt complete, in first rate order.

Three 4 Horse-Power Stationary Engines. Cylinder, 4 in. by 10 in.

One 30 Horse-Power Stationary Engine, as good as new, complete, with "Judson" governor, fly wheel, &c.

One 30 Horse-Power Stationary Engine, in good running order, but not as new as the above.

One 16 Horse-Power Stationary Engine, with new vertical boiler.

One Otis Hoisting Engine, in good order.

Two Flue Boilers, 26 ft. long, 42 in. diam., each with two 14 in. flues, iron front, grates, &c., in good order.

One Flue Boiler, 34 ft. long, 48 in. diam. with two 14 in. flues, about as good as new.

One 7 Horse Portable Engine, of our own make, used only a few months, and in perfect order.

Two No. 6 Sturtevant Blowers. Two No. 4 McKenzie Blowers. One No. 6 Andrew's Centrifugal Pump. One No. 6 Turbinate Centrifugal Pump. Three No. 0 Cameron Pumps. One No. 2 Cameron Pump. One Knowle's Pump. One Earle Pump.

Thirty Brass Tubes, 1½ diam., 12½ ft. long.

Send for illustrated catalogue and Price Lists.

J. M. WHITE,

Architect and Constructor of Charcoal Blast Furnaces. Plans, Specifications and Estimates of construction furnished upon application.

Office address,

FON DU LAC, WIS.

Weekly Spanish Market Review.

The undersigned issues the only extensive Spanish Colonial produce report printed in America, its 16th, April number being the 133d published. It appears simultaneously on *El Cronista* and in *letter sheet form*. Thirty five order-giving houses of the first-class in the city, are now subscribers to the latter. They forward the same in their correspondence to all Spanish American countries, to Brazil, Spain and Manila, together with a prices current, on which, under a special arrangement, leading *Hardware, Paint* and *Oil* houses are quoted. The review, although not pretending to be an advertising medium, is thus of great value to the party quoted. A copy with full particulars will be forwarded to manufacturers desirous of thus pushing their interests in South America, etc. Address,

C. KIRCHHOFF,
Commercial Editor "El Cronista,"
Box 2806 P. O., N. Y.

High Grades BOILER PLATE IRON, Locomotive Tank Iron, FIRE BOX IRON,

And plates of every character and variety, and of all the higher grades of Iron, from one-half inch thick to No. 18 W. G., rolled to specification.

Also, High Grades Bar Iron

Of refined and double refined qualities, and of all sizes, rolled to order.

Having a productive capacity of 20,000 tons per annum, we are prepared to fill large specifications promptly, while our Irons, being neutral in character and uniform in their working qualities, need but a trial to ensure their continued use.

Rolled Railroad Axles a specialty.

Consumers' Direct Trade solicited.

Catasauqua Manufacturing Co.,

Catasauqua, Pa.

REPRESENTED BY

Theo. Sturges, 240 Pearl St., N. Y. **Geo. B. Atlee,** 333 Walnut St. Phila.

THE CANADIAN BANK OF COMMERCE.

Capital - - $6,000,000, Gold.
Surplus - $1,500,000, Gold.

The New York Agency, No. 50 Wall Street, buys and sells Sterling Exchange, makes Cable Transfers, grants Commercial Credits, and transacts other Banking Business.

J. G. HARPER, J. H. GOADBY, } **Agents.**

Banking and Financial.

Banking House of Fisk & Hatch No. 5 Nassau Street, New York.

We buy and sell Government Bonds and Gold at current market rates; buy Gold Coupons; buy and sell Stocks and Bonds at the Stock Exchange on Commission for cash; receive deposits, and allow interest at the rate of four per cent.; make Collections, and transact a general Banking and Financial business.

We also deal in the Central Pacific and Western Pacific Gold Bonds, which, at present prices, are very desireable for investment.

We are also selling the Central Pacific Gold Six Per Cent. Land Bonds at 85 and accrued interest, secured by first mortgage on nearly 12,000,000 acres of the company's lands in California, Nevada, and Utah. *Fisk & Hatch.*

Special Notices.

DAYTON & LAMBERSON'S

(Copyrighted **Standard** Lists.)

DISCOUNT BOLT LIST.

Book form, Common and Philadelphia Lists, 20 discounts.

DISCOUNT SCREW LIST.

Iron Screws, 13 discounts.

PRICE REDUCED.

Bolt List, 60c.; Screw List, 50c. per copy. Address,

DAYTON & LAMBERSON, 83 Duane Street, N. Y.

For Sale, &c.

Narrow Gauge Tank Locomotive FOR SALE,

2 ft. gauge, suitable for quarry or blast furnace use. Weight 9 tons, cylinders 9x12, steel tyres, black walnut cab, &c. Everything fitted up in first-class style, entirely new. Address,

WARD, STANTON & CO., Newburgh, N. Y.

Blast Furnace Plans.

A complete set of working drawings For Sale, from which the North Chicago Rolling Mill Co.'s and Milwaukee Iron Co.'s furnaces were built. The furnaces are 66 ft. high and 17 ft. across the boshes, and are the largest producers and most economical furnaces of their size in the United States. They are adapted to use anthracite, bituminous, raw coal or coke.

For Sale by

JAMES HENDERSON, 30 Broadway, N. Y.

EXECUTORS' SALE OF Valuable Mineral Land.

The undersigned, Executors of *Eliza A. Crane*, deceased, will sell at Public Auction on *Wednesday, the 13th day of May* next, at 1 o'clock P. M., at the Court House in *Morristown, N. J.*, the **Valuable Iron Mine,** known as the

SCOTT HIBERNIA MINE,

Situated at **Hibernia, Morris Co., N. J.** Now leased and worked by the *Glendon Iron Co.* The mine has been worked about 25 years, and is now in good working condition and capable of producing at least 10,000 tons of first quality ore per annum. For terms of sale, apply to

EDWARD LE DOBBINS, or
BENJ. F. CRANE, Newark, N. J.

Patent For Sale

$12,000

If Closed before June 1st,

WILL BUY THE PATENT,

And $1000 Worth of Especial Tools,

ON THE

DANBURY Drill Chuck.

Only cause of selling, owner has a larger and more important enterprise on hand, which will require his whole attention and the above amount of extra cash. "**The Danbury**" is now *everywhere* acknowledged to be the best Chuck for all purposes ever put on the market, has had a large and rapid sale, being a decided "take" from the first. $20,000 would not buy it, except for reasons named. Can show clearly where over $10,000 per year can be made out of it, the principle being perfectly adapted to every thing, from a dental or jewellers' drill to a car wheel Chuck. Unless sold before June 1st, it will not be for sale. For illustrated descriptive list and further information, address the

MANUFACTURERS,

F. A. HULL & CO.,

Danbury, Conn.

IRON FOR SALE.

Manufactured by the

ULSTER BLAST FURNACE,

NAPANOCH, N. Y.

Samples and prices with,

M. M. PILLSBURY, 85 John St., N. Y.

HARDWARE STORE.

For Sale, a first class Tool and Hardware business, situated in the best business part of Jersey City. Established about 25 years, and in flourishing condition. Apply to **H. LUTTGEN, 57 Montgomery St., Jersey City.**

Valuable Iron Works, For Sale.

The undersigned offers for sale the Iron Works in Pottsville, Schuylkill County, Pa., known as "Th Washington Works," consisting of a

Large Stone Machine Shop & Foundry,

Brick Pattern House, Erecting Shop, Stone Blacksmith Shop, Brick Office, and Lot of Ground containing in front 195 feet 3 inches, and in depth 260 feet.

There will be sold with the above a large and valuable collection of Patterns, Heavy Crane Flasks and Heavy Core Spindles for making heavy Castings and Pipes of all sizes; Turning and Planing Tools.

The Works can be put in immediate operation A favorable opportunity is here presented for enterprising men. The demand for Castings and Machinery is constantly increasing in this region. The property will be sold on liberal terms. *If not sold in a reasonable time it will be for Rent.*

For particulars apply to

J. W. ROSEBERRY, Trustee, Pottsville, Pa.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, April 22, 1874.

The past week has been one of unaccustomed excitement in Wall street. What the President would do with the Senate finance bill has been the chief topic of conversation, and now that he has vetoed it, New York and Boston business men and bank officers are entitled to whatever satisfaction they can derive from the knowledge that they were mainly instrumental in bringing about this result. It is useless to discuss a finality. The bill is dead, and it now devolves upon Congress to prescribe some other remedy for the evils which are paralyzing business and continuing an industrial stagnation which should have terminated with the panic. As we have discussed this subject in our editorial columns, we need not give space to it in this place.

Among topics of more local interest, the excitement in the Stock Market has claimed the largest share of attention. There has been a break in speculative stocks, and a decline in prices ranging from 3 to 10 per cent. The most active shares have been Western Union, Lake Shore, Union Pacific, Pacific Mail, Erie, N. Y. Central, and Columbus, Chicago, and Indiana Central—the latter controlled by a "clique" which failed on Monday. The excitement has been purely speculative, and only speculators have suffered in consequence of the break. The highest and lowest of to-day's quotations of active shares are given below.

The money market has been much disturbed, but, in the main, tending toward continued ease. Call loans have averaged 3 to 5 per cent., and prime business paper has sold at 6 @ 7 per cent. Borrowers for 60 days have found it difficult to secure accommodations for less than 7 per cent., which is about 2 per cent. more than last week. The bank statement shows that the drift of currency to New York has been, at least, temporarily suspended. The total reserve of the banks has fallen during the week about one million dollars, while the total liabilities have increased not quite one-fifth of that amount. The banks have $11,957,700 lawful money above 25 per cent. of their total liabilities—a decrease of the amount so held last week of $1,079,125. The following is a comparison of the bank averages for the past two weeks:

	April 11.	April 18.	Differences.
Loans	$293,656,300	$293,464,700	Dec. $201,600
Specie	23,835,400	23,213,600	Dec. 621,800
Leg. Ten.	55,573,800	55,163,900	Dec. 409,700
Deposits	238,691,700	238,838,900	Inc. 147,200
Circ'lation	26,797,800	26,840,300	Inc. 42,500

Gold has been strong during the week, but closes weak on account of free sales at 113⅛ by those who have been holding it in anticipation of a rise, should the President sign the Senate bill. The following shows the extreme daily range of the premiums:

	Highest.	Lowest.
Thursday	113¾	113⅝
Friday	113⅞	113⅝
Saturday	113⅞	113¾
Monday	114⅛	113⅞
Tuesday	114	113¾
Wednesday	113⅞	113⅝

The market for government bonds has improved, but Southern State bonds and railway mortgages have been dull and weak. We quote below the closing prices of governments.

The following show the movements in foreign trade for the week:

IMPORTS.

	1872.	1873.	1874.
Total for week	$13,104,110	$12,346,614	$9,269,815
Prev. reported	123,023,954	127,179,971	121,674,492
Since Jan. 1	$136,128,064	$139,526,585	$130,944,307

Included in the imports of general merchandise for the week are:

	Quant.	Value.
Anvils	100	$1,040
Brass goods	12	2,121
Bismuth	2	1,006
Bronzes	5	923
Chains and anchors	81	3,902
Copper		5,553
Cutlery	68	24,113
Guns	78	7,092
Hardware	95	12,303
Iron, hoop, tons	10	782
Iron pig, tons	301	9,960
Iron, sheet, tons	29	3,869
R. R. bars	5,466	121,474
Iron cotton ties	280	936
Iron, other, tons	88	6,692
Lead, pigs	1,719	11,163
Metal goods	151	20,925
Needles	10	8,261
Old metal		500
Platina	2	4,113
Per caps	1	213
Saddlery	12	2,549
Steel	3,020	28,791
Silverware	2	332
Tin, boxes	25,106	227,282
Tin, 9,978 slabs	534,445	114,209
Wire	348	7,524
Zinc	17,680	1,240

EXPORTS EXCLUSIVE OF SPECIE.

	1872.	1873.	1874.
For the week	$3,820,953	$6,947,560	$4,309,253
Prev. reported	60,980,552	74,890,296	78,904,468
Since Jan 1	$64,801,504	$81,767,856	$83,213,721

EXPORTS OF SPECIE.

Total for the week	$503,781
Previously reported	9,045,880
Total since January 1, 1874	$9,549,661

Government bonds closed as follows:

	Bid.	Asked
U. S. Currency 6s	116⅛	117
U. S. 6s 1881, reg	119⅛	119⅞
U. S. 6s. 1881, cou	121⅛	121⅝
U. S. 1862, 5-20 reg	115	115¼
U. S. 5-20 1862, cou	118¼	118⅝
U. S. 5-20 1864, reg	116⅛	117
U. S. 5-20 1864, con	120⅛	120⅞
U. S. 5-20 1865, reg	116⅛	117
U. S. 5-20 1865, cou	121¼	121¾
U. S. 5-20 1865, reg. new	119	119¼
U. S. 5-20 1865, cou	119¼	119⅝
U. S. 5-20 1867, reg	119⅜	120
U. S. 5-20 1867, con	120¼	120½
U. S. 5-20 1868, reg	119⅜	120
U. S. 5-20 1868, cou	119⅞	120½
U. S. 10-40 reg	114½	115
U. S. 10-40 con	114¾	115
U. S. 5s 1881 reg	114¾	115¼
U. S. 5s, 1881 cou	116¼	116¾

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	99	98
Lake Shore	76⅛	74⅛
Rock Island	100	98⅜
New Jersey Central	105	105
Wabash	43⅛	41¾
Western Union Telegraph	73⅛	71
Northwestern	48⅜	47½
do. Preferred	66½	65⅜
Milwaukee & St. Paul	39¼	38¾
Panama	108	105
Pacific Mail	42¾	40¾
Erie	35⅛	34
Ohio & Mississippi	27¼	27⅛
Union Pacific	34⅛	33⅛
C. C. & Ind. Central	23	22⅛
Atlantic & Pacific Preferred	14¼	14
Hannibal and St. Joseph	29	28¼

GENERAL HARDWARE.

Trade presents no new features of importance. The amount of business doing hardly comes up, we think, to the average of two or three weeks ago, but it is still good, and in many goods manufacturers are behind their orders. The cut in Strap and T Hinges in Philadelphia, which we spoke of last week, was arranged promptly, and now the matter is considered settled. Cast Butts are still irregular, and on any considerable order a concession could be obtained.

Trade in Foreign Hardware is exceedingly dull, and nothing of interest has transpired since our last. Prices are unchanged, and we continue to quote ⅜ inch Coil Chain at 8¼ cents, gold, by the single cask; for large lots 8¼ cents is the general asking price. 6½-10-2-Traces are quoted at 60 cents per pair, and 7-10-2 at 65 cents, all gold. Anvils and Vises are unchanged.

The market for Nails is in about the same condition as at our last writing. The demand is generally reported light. Prices in Philadelphia are quoted a shade stronger than the previous week. We continue to quote $4, net, for 10d., in small lots. For orders of 500 kegs and upward this price would be shaded.

There is only a light business doing in House-furnishing goods, with prices, as a rule, in buyers' favor.

Sargent & Co. have issued a discount sheet which embodies all the changes up to this time, without making any new alterations. They adopt a very good plan in printing in heavy type all those prices which have been made since their February discount sheet. A condensed list of Mallory, Wheeler & Co.'s goods, revised and corrected to date, is attached. In a circular accompanying the discount sheet, Sargent & Co. say: "Notice discount for cash, and be assured that we were never more determined to sell our goods for prompt cash than now."

The following circular to the trade reached us too late for insertion last week. It will be read with interest:

OFFICE OF THE KEYSTONE SAW,
TOOL, STEEL AND FILE WORKS,
Front and Laurel Streets, Philadelphia.

Attention to the Hardware Trade: GENTLEMEN—We desire to call attention to our circular of November 20, 1873, wherein we guarantee prices. Our object in referring to it is to show the trade that there is no occasion to force sales through fear of any decline in prices.

As there seems to be a disposition with some few parties to cut on our goods, we assure the trade that the penalty will be rigidly enforced, viz., the forfeiture of the extra discount retained by us until the end of the season. We respectfully request that any house declining to adhere to factory rates on our goods will discontinue their patronage, as we shall positively refuse to fill their orders.

Yours, truly,
April 13 1874. HENRY DISSTON & SONS.

The difficulties in Disston's saw works with labor were noted in our last issue. The firm has since published the following card, taking the bull by the horns very squarely:

OFFICE OF THE KEYSTONE SAW,
TOOL, STEEL AND FILE WORKS,
Front and Laurel Streets, Philadelphia.

To our Employees: We embrace this opportunity of tendering our thanks to all hands, from foreman to apprentices, for the honorable stand you have taken during the recent attempt made by a few malcontents to give us trouble. We assure you that in the future, as in the past, our object shall be to give you constant employment and liberal wages, steadfastly believing in the grand old maxim that "the laborer is worthy of his hire."

There never has been, and we feel there never shall be, any necessity for a trades union in our works. We earnestly desire a continuance of the friendly relationship and kindly feeling which have hitherto existed between a large majority of the workmen and the firm; and to this end we shall hereafter refuse to give employment to any person connected with trades unions; and we would respectfully request that any of our employees who are now so connected will sever the connection or resign their situations. Very truly, yours,
HENRY DISSTON & SONS.
April 18, 1874.

Chadborn & Coldwell Mfg. Co., manufacturers of the well known Excelsior Lawn Mower, have introduced a new style this season, of which they say in their circular:

Notwithstanding the satisfactory results which have been reached, our motto is "*Excelsior*," and we now introduce for the season of 1874 the "New Excelsior," satisfied that its adaptation to the wants of all who use a Lawn Mower, will be fully appreciated wherever it is exhibited, embodying, as it does, the combined results of our experience and observation in the years devoted to the perfecting of this labor saving implement. It has been our aim to produce a mower of unequaled workmanship and best material; of requisite strength, light in weight, of easy draft and at a moderate cost. We have graduated the width of cut of our new mower, enabling us to supply the wants of those who have small grass plats, as well as those who have more extensive lawns, having added two additional sizes to our list.

They enumerate the following points of excellence in their new machine:

"Improved Ratchet, Wiper, and Knife Bar. Gears thoroughly incased. Lighter draft. Simplicity of adjustment. The gearing securely incased and will not clog. Has a full roller, without which no machine is perfect. A pawl ratchet (noiseless), needs no oiling. The front rollers are adjustable, to vary the hight of cut. Open balance wiper—with steel knives—the only practical means of securing strength and ease of draft. Patent adjustable wrought iron handle, attached to each side of the machine, being much superior to the single wooden handle used in other machines."

The following are the list prices for the "New Excelsior for 1874:"

HAND MOWERS.

No. 1.—Width of cut, 9 inches		$15
No. 2.— " " 12 "		20
No. 3.— " " 15 "		25
No. 4.— " " 18 "		30

HORSE MOWERS.

No. 5.—Width of cut, 25 inches		$75
No. 6 — " " 30 "		125
No. 7.— " " 35 "		160
No. 8.— " " 40 "		200

Horse Boots, $12 per set.

The following are the list prices for the "pattern of 1873:"

No. 0, width of cut, 11 inches	$16
" 1, " " 14 "	25
" 2, " " 18 "	30

From the above list prices Russell & Erwin Mfg. Co., who are agents for these goods, quote the following discounts: New Excelsior, Nos. 1 and 2, 25 per cent.; Nos. 3 and 4, 30 per cent. Horse Machines, 25 per cent. 1873 Patterns, 30 per cent.

Louderback, Gilbert & Co. are selling the Star Lawn Mower, price $12, less 40 per cent. We extract the following from their circular:

This is the best side-wheel Mower in market, and we place it before the public convinced that it will meet the demands and wishes of the people. It cuts 14 inches, and has five revolving knives, and is adapted for use on lawns where the grass is cut often. It will not do good work in tall grass. It is manufactured of the best material, and is furnished at a price within the reach of all. It has no small wood roller to clog with the grass and other refuse on the lawn. A Ball Rachet, which needs no oil, and is not continually being worn out and wanting repairs. It is built on old principles of slow motion, close and even cut, and performs good work in grass of three or four inches in hight, and leaves the lawn beautiful and evenly shorn.

Fisher & Norris, Trenton, N. J., have reduced the list on their Double Screw Parallel Vises. The discount remains as before. The following is the revised list, which will take effect May 1st.

No. 1, Width of jaw 3½ inches, and weighing about 25 lbs	$8·00
No. 2, Width of jaw 4½ inches, and weighing about 50 lbs	12·00
No. 3, Width of jaw 5 inches, and weighing about 80 lbs	17·00
No. 4, Width of jaw 6 inches, and weighing about 125 lbs	22·00
No. 5, Width of jaw 7 inches, and weighing about 150 lbs	30·00

J. Clark Wilson & Co. have been appointed agents for the Taylor Manufacturing Co., of New Britain, Conn., and will in future keep in stock a full line of their goods, which they offer to the trade at factory prices. They also carry a stock of Mrs. Cole's Patent Fluting Machines, for which they quote 5-inch Rolls $5·50 and 7-inch Rolls $6·50, each.

The Old Colony Rivet Works, 116 Chambers street, quote the following prices for their goods:

Nuts	5½&7c. off list
Washers	7&12c. off list
Rivets	dis 25 %
" in bulk	hat net
Philadelphia Carriage Bolts	dis 50&10 %
Machine Bolts	dis 40 %
Lag Screws	dis 40 %
Stove Bolts	dis 15 %

In December last we noticed in these columns a new pattern Shovel which was offered for our inspection, possessing some novel features. The Birmingham Shovel Co., of Birmingham, Conn., has been organized for the manufacture of this tool, which has already been proven a success in Europe, where it was first patented, and, we are informed, has had large sale to the Belgian government. The blade and shank are made out of one piece of steel, thus avoiding the necessity of riveting or welding. The handles do not require bending to fit the metal, and the whole process of manufacture is so simple that the cost is materially reduced. We are informed that by this process a better Shovel can be produced for a less cost than by the old methods of welds and riveted shanks. We have seen samples of these goods at the office of Thomas F. Stevenson, No. 31 Chambers street (sole agent for the company), which will compare favorably, in point of strength and finish, with the best goods of this kind in the market, while the price, we are informed, will average $3 a dozen below the figures quoted for first-class goods of the ordinary styles. We publish below the list for these goods, which is subject to a discount of 10 and 5 per cent. As fast as the necessary machinery is completed, this list will be extended until a full line is made. In a few days they hope to add some patterns of Scoop Shovels. An illustration of these goods will be found in advertisement on 21st page.

		Per doz.
No. 1, Pol. Best C. S. Shv'l, Sq. Pt. D Handle		$12·00
" 2, " " " " "		13·00
" 3, " " " " "		14·00
" 4, " " " " "		15·00
" 1, " " " Rd. Pt. "		12·50
" 2, " " " " "		13·50
" 3, " " " " "		14·50
" 4, " " " " "		15·50
" 1, " " " Sq. Pt. L Handle		12·00
" 2, " " " " "		13·00
" 3, " " " " "		14·00
" 4, " " " " "		15·00
" 1, " " " Rd. Pt. "		12·50
" 2, " " " " "		13·50
" 3, " " " " "		14·50
" 4, " " " " "		15·50

Unpolished Shovels 50 cents less per dozen.

IRON.

American Pig.—There is no improvement to notice in the Iron market. In all departments the same uniform dullness prevails. The consumption is not at present great enough to take up even the quantity of iron now produced, and, as a consequence, many brands of Pig Iron from distant parts of this State and of Pennsylvania are now, for the first time, being pressed upon this market, and, to induce sales, great concessions are offered. Some of the strictly prime makes of Lehigh Iron are held firm at $35 for No. 1 Foundry, $33 for No. 2 Foundry, and $31 for Gray Forge; but these prices may now be considered exceptional. They can be shaded on most brands, and in many cases the price is only governed by the necessities of the sellers. Large sales are not common, but, of course, there are a considerable number of small sales constantly making. We note sales of 1500 tons Gray Forge on private terms, and 500 tons at $27·50. We quote: Foundry No. 1, $34 @ $35; Foundry No. 2, $31 @ $33; Gray Forge, $27 @ $31. These prices are for the best brands.

Scotch Pig.—In Scotch Iron we note sales during the week of 200 tons Eglinton at about $37, in lots; 150 tons Coltness on private terms, and 100 tons Glengarnock at $38·50. We quote Coltness, $39 @ $40; Glengarnock, $38·50; and Eglinton, $37. It will be seen, by reference to our cable report, that in Glasgow Coltness has advanced, while Eglinton has declined, Gartsherrie and Glengarnock remaining with little change.

Bar.—We quote Bars of Eastern make at 3·1 @ 3·3 cents, at mill. There does not seem to be any improvement in demand.

Rails.—Rails remain without change. We quote Foreign, $54 @ $58, gold, and American, $58 @ $60, currency, at works.

Old Rails.—We quote T's, $40. Double Heads are not offering. We do not hear of any considerable transactions.

Scrap.—We quote Wrought Scrap, from yard, $40 @ $42·50, with little doing. We note a sale of 350 tons on private terms.

BRITISH IRON MARKET.

(Specially reported by cable for The Iron Age.)

WEDNESDAY, April 22, 1874.

Scotch Pig.—Since our last report, a week ago, the market has been depressed, but has rallied, and prices are now firmer. The following are makers' prices:

Coltness, No. 1	92·6
Gartsherrie, No. 1	86/
Glengarnock, No. 1	86/
Eglinton, No. 1	76/

Manufactured Iron.—The market is dull; demand small; prices firm; amount of business light. We quote: Best Staffordshire Bars £12.

Rails.—The market is quiet; demand improving; prices steady; amount of business fair. We quote: Welsh Rails, £9 @ £9. 5.

METALS.

Copper.—The transaction alluded to in our last report did not take place. The dealings in Copper, on the spot, have been to a moderate extent only, at between 24¾c. and 25c.; the demand from consumers in a small way is good, and improving. To arrive, a couple of hundred thousand pounds, June delivery, are reported sold at 24¾c.; May, June, July delivery is worth 24½c. Accounts from the Lake Superior region, about the time when navigation is likely to open, are conflicting. One report has the following: "Navigation will open about a month later this year than usual. The stage still runs over the ice of the Lake, and the inhabitants do not expect it to move before the middle of May, when it will still be unsafe, except for large iron steamers. But the Sault Ste. Marie Canal coffer dam has to be dredged out before vessels can pass, and that can only be done after all the ice is gone. Thus it may take till the middle of June before Copper supplies come down." The other report mentions that it is claimed that a dredge will be at the Sault Ste. Marie as soon as navigation opens, and in 48 hours can scoop out the coffer dam, which it was feared would delay opening the canal. To-day's cable report from London quotes for Tough Cake, £83. 10/. The English evidently make the best of the reported large charters at Valparaiso, and depress prices on purpose to force the companies on the West Coast into consigning them their Copper. Our Valparaiso report *via* Panama is to hand this minute, and we condense it here instead of placing it under the head of "foreign:" "March 17.—Up to the 14th inst. the market remained steady, 200 tons Lota and 250 tons Urmeneta selling at the previous figure of $18, on board, with 60/ freight, and, beside, 75 tons Lambert, at $18·10, with 55/ freight, all per steamer. On the 14th inst. we received a cable dispatch that London was down to £78. 10/, which immediately produced a declining tendency here, with a sale of 75 tons Urmeneta at $17·50, at which there are more buyers. On shore here $17·75 was accepted for 400 quintals, but there are no further sellers at this. Of Regulus two cargoes sold, ere the last mail left, at $7·45, on board, and $7·40 has been accepted for another lot since. No sales, for export, of Ore. Total sales of Copper during the fortnight, 13,631 quintals; of Regulus, 46,500 quintals. Ore is nominally worth $3 for 25 per cent." The Copper, it will be seen, amounted to 600 tons, and the Regulus, at 50 per cent., to 1040; together, 1640 tons pure Copper. This is not overmuch, and strengthens the belief that the English market is artificially depressed. The manufactures of Copper are steady as follows: Copper Bolts, 35c.; Sheathing (over 12 oz.), 33c.; Braziers (over 16 oz.), 35c. Yellow Metal also tolerably well supported at 24c. per pound for Sheathing, and 30c. per pound for Bolts, net cash.

Tin.—The reaction in Europe and here, in a favorable sense, has been vigorous. The following despatches came to hand thus far this week: LONDON, April 20.—"English Tin in strong speculative demand at £101 @ £102." AMSTERDAM, April 21.—"Tin advancing daily, and quoted 61 guilders the 50 kilos. The Dutch markets are strong, and higher prices are probable." LONDON, April 21.—"Tin in strong speculative demand, English L. and F. £106, and Straits at £104 @ £105. The excitement in Holland is sympathized with here." SINGAPORE, April 21.—"Tin firm at $26·50 per picul, with a good demand." PENANG, April 21.—"Tin market excited and prices advanced to $28 per picul. Cholera raging at Young Ceylon, and likely to affect the supply." Young Ceylon is the name of the place whence the Penang Tin is received, and has nothing to do with the Island of Ceylon, from where we receive the Plumbago. The movement in Tin at New York was all the more emphatic, as for a week past the metal trade, seemingly, had made up their minds that the Anglo-Dutch depression was an unreasonable affair; and, beside, as we have said under the head of Copper, there is a good consumptive demand for all metals at this center, not leading to large transactions from first hands at a time, but yet telling on the supply, unusually light in the case of Tin. With such a healthy element to rest upon, the dealings have been quite extensive, considering the little that there is on the spot and to arrive. The improvement during the week has been about 1c., gold, all round, and the following is the summing up of the transactions: Straits—3000 slabs "spot" and "to arrive" sold, of the latter very little, up to 25c. "spot," and 24½c. "to arrive," gold, the asking prices at the close. English L and F—Between 100 and 150 tons sold, "spot" and "to arrive," up to 22c., now 22¼c., asked, gold. English Refined—50 tons sold up to 23c., still the asking price at the close, gold. Banca, with small sales, improved to 26½c., gold. The market closes with great firmness. The Penang telegram is looked upon as likely to excite the people in Holland still more. The Tin Plate market has been gradually advancing under the two-fold stimulus of the Block Tin improvement and the Welsh strikes, about which we gave in detail the latest cable news in our last, since when the situation remains essentially the same. The sales for the week sum up 10,000 boxes on the spot and "to arrive," and the market closes with firmness as follows: I. C. Charcoal, $10·50 @ $11; I. C. Coke, $8 @ $8·50; Coke Terne, $7 @ $8; and Charcoal Terne, $9·25 @ $9·75, all gold.

Lead is selling in moderate quantities to consumers. The market is steady, and the comparatively light stock we have is held with firmness by the few owners. We quote as follows: Domestic, 6c. @ 6¼c., gold; Foreign, 6¼c. @ 6⅝c.; and Fine do., 7c. @ 7⅛c., all gold. There are no late European telegrams here. The manufactures of Lead are steady at the following quotations: Bar, 8½c.; Sheet and Pipe, 9c.; and Tin-lined Pipe, 16½c., with a discount of 10 per cent. to the trade.

Spelter and Zinc.—Nothing beyond a moderate business between the jobbers and consumers has transpired in Spelter. The manufacturers have no orders, and do not work on stock. The following are the quotations: Missouri, 7c. @ 7¼c., currency; Foreign, 6½c. @ 6¾c., gold. Sheet Zinc neither shows any particular animation, and we quote, nominally, Silesian and Mosselmann Sheet, 8¼c. @ 8½c., gold; and Western, 8¼c.

Antimony unaltered and quiet at 12⅝c. @ 12¾c., gold, asked.

Plumbago.—COLOMBO, Ceylon, April 21.—*Per Telegraph:* "To-day's nominal quotation: Lump, £17; Chip, £9; and Dust, £5, free on board, with commission, and exchange at par, but without freight."

COAL.

The Coal market shows a slight improvement this week as compared with last, but dealers still complain of small orders and general dullness. Anthracite is selling at April prices, but the schedule for May advances the quotations 10 cents per ton. The circular of Mr. Frederick A. Potts, No. 110 Broadway, quotes as follows for May delivery:

SHIPPED FROM PORT JOHNSTON, ELIZABETHPORT, HOBOKEN AND TRENTON.

	Lump.	Steamer.	Broken.	Egg.	Stove.	Chestnut.	Washed Pea.
	$	$	$	$	$	$	$
L. & W. C. Co.'s, Wilkesbarre	4 70	4 80	4 90	5 05	5 05	4 50	3 60
L. & W. C. Co.'s, Old Co. Lehigh	5 65	....	5 60	5 60	5 75	4 80	3 85
L. & W. C. Co.'s, Plymouth Red Ash	....	....	4 90	5 05	5 70	5 50	....
L. & W. C. Co.'s, Honeybrook Lehigh	5 50	....	5 45	5 45	5 60	4 65	3 85
L. & W. C. Co.'s, Spring Brook Lehigh	5 50	...	5 45	5 45	5 60	4 65	3 85
L. & W. C. Co.'s, Room Run	5 15	....	5 15	5 15	5 50	4 50	3 85
Fulton Lehigh	5 65	....	5 60	5 60	5 75	4 80	3 85
Scranton	4 70	4 80	4 90	5 05	5 50	4 50	....

Domestic trade has been more active than last week, but dealers are only doing about two-thirds of business usual at this season of the year. The general depression in the iron trade accounts for the present limited consumption of Anthracite.

The market for Bituminous Coal still continues very dull, and our quotations are about the same as quoted in our last report. The quotations for Anthracite are $5 to $6, by the cargo. For Gas Coals the prices are: Pennsylvania and Westmoreland Gas, $7·50 at South Amboy, and $8 delivered here; West Virginia, $7·75; Cumberland, soft, $7 @ 7·25.

The demand for foreign is limited, and prices are lower. The quotations are: Liverpool House Cannel, $18 @ $19; Liverpool Gas, $11; Newcastle Gas, $7·50 @ $8; and Scotch, $8 @ $10, currency.

The coal transported over the Cumberland Branch Railroad during the week ending April 18, 1874, amounted to 6120 tons, as against 4570 tons shipped in the corresponding period of last year, showing an increase of 1550 tons. Over the Cumberland and Pennsylvania Railroad, for the same period, the shipments were 48,810 tons, against 53,137 tons shipped in 1873, a decrease of 4327 tons.

OLD METALS, PAPER STOCK, &c.

The market for Old Metals, Rags and Paper Stock has been very dull this week, and prices remain the same as quoted in our last report. Cotton, woolen and paper mills are running very slowly on small orders, and consequently the demand for Rags and Paper Stock is very light. There is but little call for Old Metals. The purchasing prices offered by the dealers are as follows:

Old Metals.—Copper, 18c. per lb.; Yellow Metal, 13c.; Brass, 13c. @ 14c.; Composition, heavy, 14c. @ 15c.; Lead, solid, 5½c.; Tea Lead, 5c.; Zinc, 4c. @ 5c.; Pewter, No. 1, 21c.; do. No. 2, 8c. @ 12c.; Spelter, 5c. @ 5½c., Wrought Iron, 1½c.; Sheet do., ½c.; Cast, do., ¾c. @ 1c.; Machinery, do., 1c.

Rags, &c.—Canvas, Linen, 5c. @ 5½c.; do. Cotton, No. 1, 6c. @ 6½c.; No. 2, 3½c.; White, No. 1, 6½c.; No. 2, 4c.; Colored, do., 2c. @

3c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 6c.; Gunny Bagging, 1¼c. @ 1½c.; Jute Butts, 1¾c. @ 2c.; Kentucky Bagging, 3c. @ 3½c.; Book Stock, 3½c. Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c. @ 4½c.; Oakum Junk, No. 1, 4½ @ 5c.; do. No. 2, 3½c.; Tarred Shaving 1c.; Grass Rope, 3½c.

PHILADELPHIA.

PHILADELPHIA, April 22, 1874.

There is a slightly better feeling in the iron market, with not, however, any increase to note in the volume of business. A series of sensational telegrams and statements from here and the interior, calculated to unduly depress the market and injure firms named, were issued at the close of the last period under review. The effect of these speedily passed off upon an investigation of the misstatements. The general impression seems to be that the lowest point of the year in prices has been reached, and that the better state of things noted West will soon be felt here. The universal reply to a pretty close canvass of the trade has been of an improved feeling, a little better inquiry and a better prospect. Forge Irons are comparatively scarce, and with any demand would advance. There is more doing in Old Rails and some inquiry for New Rails. Prices are without change, viz.:

PIG IRON.—No. 1 Foundry, $35; No. 2, $33; Gray Forge, $30.

BARS—3·2 to 3·3 cts. per lb.

RAILS—$60, at works.

OLD RAILS—$41 to $42.

SCRAP—$38 to $40, for No. 1 Wrought.

The sales include 1000 tons Gray Forge at $28, at furnace. Small lots of Foundries at quotations. 500 tons Rails at $62·50, and 1000 tons Old Rails at $41·50, here; 150 tons same at $41.

PITTSBURGH.

PITTSBURGH, April 19, 1874.

PIG IRON.—The market has been very quiet during the past week, unusually so, and while it is evident that the demand for the present, at least, has fallen off largely, and this is not surprising, in view of the large purchases made recently, the offerings do not appear to have increased any, nor is there any quotable change in prices. Producers, as a general thing, appear to be very confident that any further shrinkage in values is almost out of the question; hence only those who, owing to their financial necessities, are obliged to, are willing to sell at anything below or, in fact, even at current rates. Some have blown out, others will do likewise, as soon as they have worked up ore they have on hand, and the indications are that there will be a very decided falling off in the production within the next sixty days, unless there is a very decided change in the general position of the market in the meantime. In addition to the Pig that has been made in this vicinity—and, by the way, the furnaces here and in the adjacent country, which includes the Shenango and Mahoning Valleys, are now able to supply the wants of this market—there has been considerable shipped here from Missouri and Tennessee on consignments, the demand in those sections having been very much curtailed by the suspension of the mills there. Prices, as already intimated, remain substantially as last noted; No. 1 Foundry, $33 to $35, 4 mos.; No. 2, $29 to $31; Gray Forge, $27 to $27·50, cash, and $28 to $28·50, 4 mos. There were sales of the latter reported at $26 to $27, cash and time, but it is inferred that the Iron was not first-class, or perhaps the seller was in such a position as to be obliged to realize at the best price that could be obtained on the spot.

MANUFACTURED IRON.—There is a continued steady demand for Fmished Irons, and while orders have slacked off, as compared with a month ago, the mills still have about all they can do, the best evidence of which is that they are all in operation, some of them working up to their full capacity. Manufacturers, generally, complain more about small margins than a scarcity of orders. They claim that prices are unnecessarily low; also, that the recent shrinkages in the cost of the raw article has been of no perceptible advantage, as the product has been reduced correspondingly; in other words, that their margin is no better now with pig at $28 than when it was $32, and they have made but little money. Quotations may be given on a basis of 2¾c. forBars for round lots, and one to two tenths additional for smaller lots.

NAILS.—There is a continued steady demand for Nails, orders are still coming in pretty freely, and the factories have about all they can do, but, as in the case of Iron, manufacturers complain that the margin for profit is very small, also, that there is no necessity for it. The card remains nominally unchanged at $4·12½ per keg, but actual selling rates may be quoted at $3·80 to $3·85, with usual two per cent. off for cash.

STEEL.—There is no falling off in the demand for Steel. On the contrary, trade is better this month than it was last month, and the indications are that it will be better in May than it was in April. From all that your correspondent can learn, the market here is in a satisfactory condition to manufacturers. There is not much competition—consequently, but little cutting, as compared with the Iron trade.

COAL.—Since the writing of my last there has been a freshet in our rivers, and the shipments of Coal were heavy—unusually so—reaching between 6,500,000 and 7,000,000 bushels. Notwithstanding the market to operators is in a very unsatisfactory condition, they are still pegging away in anticipation of the good time coming, but which, judging from present indications, is a good way off. This has been an unusual season for navigation; hence, all the down river markets are full to overflowing and prices are very low.

COKE.—There is no improvement to note in this important staple, and what is still worse, the prospects for an early change for the better are not very encouraging. The Coke trade is governed more or less by the Pig Iron trade, in the manufacture of which it is largely employed, and until there is a very decided change in the position of the market for the former, we need not look for any activity in the latter. Prices nominally unchanged, ranging from $3 to $3·25 per ton, delivered on cars in Pittsburgh.

SCRAP IRON.—The market continues quiet, but prices have undergone no quotable change. Following are the buying rates: Old Wheels, $31 to $32 per ton of 2000 lbs.; Old Axles, Iron, 2 cts. per lb.; Steel, 2¼ cts.; Smith Scrap, 1½ cts.; Boiler Scrap, $1·90; thin Sheet Scrap, 1 cent.; Punchings, 1½ cts.; Wrought Turnings, 1½ cts.; Burnt Grate Bars, $10 per ton.

The Pittsburgh *Commercial*, of the 18th, says: The sales of Pig Iron during the past week indicate a slight reduction in price, and a considerable decrease in the volume of business. Notwithstanding the fact that stocks in hands of the consumers are very light, they manifest an unwillingness to buy, except in small lots from week to week to meet current orders. Some makers of good brands are disposed to hold their Iron out of the market, under the impression that the depressed condition of business and trouble with workmen, which is causing so many of the furnaces and rolling mills East to cease operations, will enable them to obtain better prices hereafter than can now be realized. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

500 tons Gray Forge	$27·00—cash.
200 tons Gray Forge	26·00—cash.
200 tons Gray Forge, neutral	27·00—4 mos.
100 tons White and Mottled, neutral	26·00—4 mos.
100 tons Foundry	29·00—cash.
100 tons No. 2 Foundry	28·50—cash.
100 tons Gray, neutral	28·00—4 mos.
60 tons Foundry	30·00—cash.
30 tons Foundry	30·00—4 mos.

ANTHRACITE.

10 tons No. 1 Foundry	$35·00—4 mos.

CLEVELAND.

CLEVELAND, April 18.—The Pig metal market has been somewhat more active during the past week than when last quoted. There has been considerable inquiry for foundry grades of bituminous Irons. Foundry has ruled about $1 lower than last quotations, and may be fairly called now at $33 to $34 for No. 1, and $31 to $32 for No. 2. Forge Irons have been sold in small quantity as low as $27, four months. Furnaces, generally, are looking for still better prices than heretofore, basing their elevated ideas on the large sales of Lake Superior ores made during the past week. Several of the Lake Superior companies have sold their No. 1 Specular Ores at $9, afloat at Cleveland. This is the highest price the companies have pretended to ask for their Ore, it may be said, with one exception, that of the Republic, and holders of Iron generally find some encouragement in this. I may add, however, that this 100,000 tons, about the amount sold at this writing, has all, or nearly so, been purchased by furnaces having mills owned in connection with them. Lake Superior Charcoal for Bessemer has been in slight request, although some sales of this quality have been made for Foundry use. The high grades have been in active demand for malleable use. The car wheel trade being comparatively at a stand still again, the slight activity noticed a month since having entirely died away.

CINCINNATI.

Messrs. ADDY, HULL & CO., under date of April 20, write us as follows: The market has undergone no material change in the past week. Demand continues limited for all grades. Prices are not firm, and must be considered to some extent nominal.

HOT BLAST CHARCOAL.

Hanging Rock No. 1 ℔ ton	$36·00 @ 38·00—4 mos.
" " No. 2	33·00 @ 37·00—4 mos.
" " Forge	30·00 @ 32·00—4 mos.
Tennessee No. 1	33·00 @ 36·00—4 mos.
" Forge	30·00 @ 32·00—4 mos.
Alabama No. 1	34·00 @ 36·00—4 mos.
Missouri No. 1	38·00 @ 39·00—4 mos.
" No. 2	35·00 @ 36·00—4 mos.

HOT BLAST STONE COAL.

Missouri No. 1 ℔ ton	$35·00 @ 37·00—4 mos.
" Forge	30·00 @ 31·00—4 mos.
Ohio No. 1	33·00 @ 36·00—4 mos.
" Forge	30·00 @ 31·00—4 mos.
Scotch Pig, No. 1	

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel ℔ tn.	$55·00 @ 60·00—4 mos.
Missouri " "	55·00 @ 57·00—4 mos.
Kentucky " "	55·00 @ 57·00—4 mos.
Tennessee " "	55·00 @ 57·00—4 mos.
Georgia " "	55·00 @ 57·00—4 mos.
Alabama " "	55·00 @ 57·00—4 mos.
Machinery and Forge	55·00 @ 57·00—4 mos
Blooms	100·00 @ 110·00—4 mos.

LOUISVILLE.

Mr. GEO. H. HULL, under date of April 20, writes us as follows: The market is quiet but steady. There is no immediate prospect of the mills resuming work, and Forge Irons are not salable at quotations. Foundry and Car Wheel Irons are in moderate request to supply immediate wants. The usual time, 4 mos., is allowed on the quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$38·00 @ 40·00
" 2 " " " "	34·00 @ 36·00
" 1 Forge, " " "	31·00 @ 32·00
" 1 F'dry, from Tennessee Ores	35·00 @ 40·00
" 2 " " "	33·00 @ 35·00
" 1 Forge, " "	30·00 @ 31·00
" 1 F'dry, from Alabama Ores	35·00 @ 38·00
" 1 " " Iron Mountain Ores	41·00 @ 42·00

HOT BLAST STONE COAL.

No. 1 F'dry, from Missouri Ores	34·00 @ 36·00
" 2 " " " "	32·00 @ 33·00
" 1 Forge, " " "	30·00 @ 31·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	60·00 @ 63·00
" " Tennessee Ores	53·00 @ 55·00
" " Alabama Ores	55·00 @ 57·00
" " Georgia Ores	55·00 @ 57·00
" " Missouri Ores	53·00 @ 57·00
" " Kentucky	55·00 @ 57·00

ST. LOUIS.

Messrs. GARRETT, MCDOWELL & CO., under date of April 18th, send us the following: Some large sales of Mill Iron grades have been made here at some concession in price since we last wrote you. The market is now bare of that quality, and stocks light of all grades. Foundry Irons are only bought as consumers need stock. The market is quiet and prices nominally unchanged. We quote:

HOT BLAST STONE COAL

No. 1 Foundry, from Iron Mountain and Maramec Ores	$34·00 @ 35·00
No. 2 Foundry, from Iron Mountain and Maramec Ores	31·00 @ 33·00
No. 1 Forge, from Iron Mountain and Maramec Ores	29·00 @ 30·00
No. 1 Foundry, Massillon, O	42·50 @
No. 1 " Tennessee Cold Short	34·00 @ 36·00
No. 1 " Ohio Cold Short	37·00 @ 39·00

HOT BLAST CHARCOAL.

No. 1 Foundry, from Iron Mountain and Maramec ores	36·00 @ 43·00
No. 2 Foundry, from Iron Mountain and Maramec Ores	32·00 @ 40·00
No. 1 Foundry, from Tennessee ores	35·00 @ 37·00
No. 1 Forge, " "	31·00 @ 33·00

COLD BLAST CHARCOAL.

Car Wheel, from Hanging Rock Ores	58·00 @ 62·00
" " Tennessee or Alabama Ores	55·00 @ 59·00

BOSTON.

BOSTON, April 18, 1874.—The market for Bar Iron is quiet, and there is no material change in prices. Pig Iron is in limited demand, and Scotch can be bought at lower prices, but the sales are few. We quote yard lots of American Pig Iron at $36 to $41 per ton, including No. 2 extra at $36 to $38, and No. 1 at $39 to $41. We quote Eglinton at $42, Coltnes at $47 to $48, Charcoal at $50 to $60. American and English Refined Bar Iron is selling at $70 to $85 per ton for the ordinary sizes, and $85 to $90 for extra sizes, according to size. Cast Steel is selling at 16c., gold, for English, 15c., currency, and 15c. to 15½c. for American, currency, with fancy brands of English selling at 17c., gold. Anchors are selling at 8½c. per lb.; Chain Cables (⅝ to 2 inches thick), 7c. to 8¾c. per lb.; Coil Chains, 7½c. to 16c. from 3-16 to 1¼ inches. We quote Boiler Plates at 6¾c. to 7½c. for Flanges, 4¾c. to 5c. for C No. 1, and 4½c. to 4¾c. per lb. for Common and Tank. Russia Sheet is selling at 18c., gold, and 20c., currency, for perfect lots. English and American do. are selling at 6¾c. to 8¼c. per lb. currency. We quote Galvanized Sheet Iron, No. 20, at 11c.; Nos. 21 to 24, 12c.; 25 and 26, 13c.; 27, 14c.; 28, 15c. Nails are selling at $4·25 for 10d to 60d, and other sizes at a range of $4·50 to $8·25 per 100 lbs., less discount of 15c. per keg to the trade on 100 keg lots. Horse Nails, 28c. for No. 7.—*Commercial Bulletin.*

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of April 21, 1874: Trade continues ruling depressed for the season. Finished irons are shaded 1-10c. for cash orders, and we now quote same at 3 to 3 1-10c., with the remainder of the list proportionately weak.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick.. 1 to 4½ wide by 1½ to 2 thick	3 to 3 1-10c per lb.
Round and square, ordinary sizes, from ⅜ to 2 inclusive	3 to 3 1-10c. "
Hoop Iron, 1½ wide and upward	4¼ to 5c. per lb.
Band Iron, from 1¾ to 4 in. wide	4 to 4¼c. "
Horse Shoe Iron ⅜ to 1 wide by ⅜ to ⅛ thick	4½ to 5c. "
Norway Nail Rods	7¾ to 8¼c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	16¼c. "
Machinery Steel	11½c. "
Cast Spring Steel	11c. "
Homogeneous Steel Plate	13c. "
Perkins' Horse Shoes, per keg of 100 lbs	$5·87½
" Mule Shoes " "	6·87½

Common Horse Nails, from 14c. to 18c per pound.

	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per ℔.
	10	9	8	7	6	
Globe Horse Nails	23	24	25	26	28c.	per ℔

R. R. Spikes.....5½ by 9-16 at 3¾c. to 4c. per lb.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending April 21, 1874:

Hardware.

Beam & Murray, Mdse. pkgs., 4
Boker Hermann & Co. Cutlery, pkgs., 8 Metal ware, cks., 6
Bawo & Dotter, Casks, 1
Clark, Wilson & Co. Mdse. pkgs., 1
Campbell R. Cases, 2
Degraw, Aymar & Co. Chains, cs., 1
Friedmann & Lauterjung Cutlery, cs., 3 Mdse. pkgs., 3
Field A. & Co. Cases, 14 Casks, 2 Anvils, 6 Chains, cks., 4 Mdse. pkgs., 44
Hilger E. & Sons, Iron ware, cs., 2 Mdse. pkgs., 1
Keller L. H Metal ware, cs., 1
Lau & Garlichs, Mdse. pkgs., 4
Moore's J. P. Sons, Mdse. pkgs., 2
Schuyler, Hartley & Graham, Mdse. pkgs., 9
Van Wart & McCoy, Cases, 4 Mdse. pkgs., 12
Ward A. Mdse. pkgs., 2
Wiebusch F. Chains, cks., 33 Casks, 10
Windmuller L. & Roelker Arms, cs., 9
Order. Chains, cks., 39

Iron.

Belmont Aug. & Co. Spiegel Iron, lots, 1
Brown Bros. & Co. Bars, 6416
Crocker Bros. Pig, tons, 100
Henderson Bros. Pig, tons, 300
Holdane, Hopkins & Stokes, Bar, bdls., 164
Kunhardt & Co. Scrap, hhds., 8
Laughland & Co. Haybands, bdls., 75
Lennox E. S. Lots, 214
Lathrop F. S. Rails, 2644 Pieces, 178
Lang W. Bailey & Co. Bars, 731 Bundles, 370
Morton, Bliss & Co. Rails, 1511
Mott J. L. Iron castings, bxs., 2
Naylor & Co. Fish plates, bdls., 780 Bars, 395 Mdse. pkgs., 30
Randolph L. F. Rails, 1424
Weston D. M. Iron, pkgs., 6
Williston & Knight, Bars, 150
Order. Rails, 3516 Rods, 549 Sheet, cs., 40 Bales, 168 Bars, 853 Scrap, tons, 7; lbs., 100; cwt., 370 Bundles, 19

Steel.

Abbott & Howard, Barrels, 50
Brown Wm. Bundles, 73 Cases, 42
Congreve Chas. & Son, Rails, 1048
Garvin E. L. Bundles, 134
Hogan John, Bundles, 16 Cases, 22 Casks, 1
Jackson Wm. Bundles, 110
Prosser Thos. & Son, Tire forgings, 46
Sanderson Geo. & Co. Cases, 4 Sacks, 6 Bundles, 12
Van Wart & McCoy, Bundles, 400
Order. Rails, 2525 Bundles, 690

Metals.

Byrne Joseph & Co. Tin plates, bxs., 500
Brown, Shipley & Co. Antimony, cks., 17
Bruce & Cook, Tin, slabs, 150 Tin plates, bxs., 952
Cort N. L. & Son. Tin and terne plates, bxs., 351
Galway & Casado, Lead, pigs, 800
Grund F. & Cerero, Lead, pigs, 460; bars, 750
Lamarche H. Zinc, bbls., 490
Montell F. T. Scrap, copper, kegs, 3 Scrap, brass, cks., 15; bbls., 26; pieces, 4; cs., 3; pkgs., 4 Scrap, lead, cks., 1; pcs., 1
Marsching J. Scrap, cs., 4
Naylor & Co. Tin plates, bxs., 120
Manfrille Sebastian de Lead, pigs, 1717
Phelps, Dodge & Co. Tin plates, bxs., 5188 Mdse. bdls., 20 Tin, slabs, 311 Tin, ingots, 849
Rivera J. de & Co. Scrap copper, hhds, 1
Order. Tin and terne plates, bxs., 4285 Tin, ingots, 3280 Scrap copper, bdls., 8 Tin, blocks, 500 Lead, pigs, 1400 Scrap, lbs., 300

FOREIGN.

GREAT BRITAIN.

Messrs. J. Berger Spence & Co., London, Glasgow and Manchester, under date of April 4th, 1874, report:

METALS.—Buyers are still holding aloof in this market, although purchases might now be made on terms which would have appeared incredible a few months ago. The values of Scotch Pig Iron Warrants and Pig Iron generally have been unfavorably affected by the recent heavy failure in Glasgow, but at the close a partial recovery has taken place. The strike or lock-out of the men, and the consequent stoppage of so many blast furnaces, has necessarily diminished the production in a corresponding ratio, and one of the first results is a renewal of the withdrawals from Messrs. Connal's store, out of which 1080 tons have been taken during the week, leaving a present stock of 37,070 tons in store. The shipments for the past week are returned as 10,602 tons, against 11,167 tons in the corresponding week of last year. Considerable underselling is taking place in Middlesborough Pig Iron. The demand for manufactured is almost nil, pending the quarterly meetings, which will be held next week in South Staffordshire. Copper is quiet. The Charters from the West Coast for the last fourteen days of February are cabled as 1760 tons, and the stock of Copper on spot and afloat is reported as 38,866 tons, against 37,875 tons at this time last year. Tin is again lower, with a stock of 1977 tons, against 2187 tons in 1873. There is not much change in Lead. Spelter at nominal rates; the stock in London now stands at 135 tons, and in Hull 535 tons.

IRON—"Ayresome" Yorkshire Pig Iron, prices nominal, No. 1, ——; No. 2, ——; No. 3, ——; No. 4 (Foundry), ——; No. 4 (Forge), ——, net cash, or 2/ extra 4 months' bills. Scotch Pig warrants, 77/6 to 80/. Staffordshire Bars, £11/10 to £14. Hoop Iron, £13 to £14. Gas Tubes, 60 per cent. off list. Boiler Tubes, 37½ per cent. discount.

COPPER.—English Tough Ingot, £84 to £86. Chili Bars, £74 to £76.

TIN—English Ingot, nominal, £98 to £94. Straits, £86 to £88.

TIN PLATES.—Best Coke, I. C., 28/ to 30/; Charcoal, I. C., 36/ to 40/ per box.

LEAD.—Best English Soft Pig, £22 to £22/10. Refined Red Lead, £24 to £25.

ANTIMONY.—French Star, £53 to £54.

SPELTER.—Silesian, £21/15 to £22. English, £22 to £23.

FRANCE.

(*Le Moniteur des Interets Materiels*).

PARIS, April 5, 1874.—*Metals.*—The European Metal markets remain in the same condition as heretofore: little doing and prices steadily declining. The first quarter has been a most unfavorable one, and will not be forgotten for a long time to come on account of the heavy losses which it involved. *Copper.*—The general Copper market is quiet, no large dealings, and prices now a little steadier. At Liverpool prices declined from £2 to £3 per ton, transactions being limited to the filling of more immediate requirements, and the general outlook being the reverse of reassuring. Stock at Liverpool and Swansea of Chilean Copper, end of March, 20,400 tons of pure Copper, against 21,500 in 1873 and 12,200 in 1872. Best Selected at London, £87 to £89; Chili Bars, 96 per cent., £74 to £76; the same at Liverpool. Paris is languid. Chili Bars deliverable at Havre 202·50, Ingots here 217·50. Havre is quiet at 200 to 210, Chili Bars; Ingots, 215 to 225 francs; Marseilles is weak at 220 Chili Ingots. The German markets, on the whole, have been ill-sustained. We receive the following quotations per telegraph to-day: Berlin Refined Chili, 29 to 30 thalers; Hamburg, Best Selected, 88 marks; Stettin Chili Bars, 30 to 31 thalers. The Dutch markets are apathetic, Rotterdam, Droutheim Copper, 50 to 52 guilders; Amsterdam, English ditto, 56 to 58. *Tin.*—The European Tin quotations have been fluctuating according to the daily telegrams from London and Holland, and the unsteadiness of values has been a great impediment to a resumption of more active business in the metal. The following are the closing rates per telegraph to-day: Marseilles, Banca, 270 francs; Havre, Straits, 260; Berlin, Banca, 34 to 34¼; Hamburg, Banca, 108 marks. Paris is dull at 247½, Banca. *Lead.*—Stocks of Lead are very much reduced at the various centers, yet the metal is dull from general unfavorable causes, which operate adversely and prevent buoyancy in any one article or branch. Although money is abundant, there is general distrust and a disinclination to operate beyond present requirements. A good many unfavorable circumstances have combined to produce this state of affairs—a poor harvest, the Indian famine, the chaotic state of the Peninsula, the over-issue of paper money in Italy, and a sudden decline in values on the Vienna Exchange. It is thus explained that even a metal like Lead, however well situated statistically, sells below its intrinsic value. Here at Paris we have gone as low as 53¾ francs for French. Havre is 54 to 55 for Spanish; Marseilles, do., 53; Berlin, Tarnowitz, 7⅛ to 7¼ thalers; Hamburg, English, 24½ to 25 marks; Stettin, Tarnowitz, 8 thalers; Amsterdam, Soft Lead, 13¼ to 13¾ guilders; Rotterdam, Spanish, 13; St. Petersburg, 29 roubles the 164 kilos. *Spelter*—Though in as favorable a position as Lead, this metal neither leaves room for cheerful comments. Paris is quiet at 58½ francs for Silesian, deliverable at Havre. Havre is 58 to 59; Berlin, W. H., 8½; Silesian, 7¾ to 8 thalers; Breslau, W. H., 8 thalers; Hamburg, Silesian, 23 marks; Amsterdam, Silesian, 13 to 13¼ guilders. *Iron*—No change for the better in France. The improved outlook which we alluded to in our last, as then apparent, has been another disappointment. Nevertheless, the little that transpires in the way of dealings shows a certain degree of firmness. At all events, the declining tendency seems to have been interrupted. Wrought Iron in the Haute-Marne is quoted 230 francs, and thick Sheet Iron, 320; Pig Iron, 75, "affinage," and 125 "moulage." No change at the North. Rails and Sheet Iron, like everywhere else, are best sustained. Little doing here; Wrought Iron, 250. The National Assembly having voted 880 kilometres of new lines of railroads, representing 70,000 tons of rails, 20,000,000 francs worth of rolling stock, and 30,000,000 francs of public constructions, not to speak of the iron-plating of the fortifications of Paris—it will be seen that the domestic Iron consumption of France in immediate prospect, under this head alone, will not be a trifling matter in 1874. *Coal*—The gas works of this city have made a contract with four Essen (Prussia) companies for 450,000 tons of coal, at 3½ thalers per ton, for three years, precisely at half price of what they paid the identical mines a year ago. This shows the great change wrought. The French Coal market may be summed up in three words: uncertainty, confusion and stagnation. At the North and in the Pas-de-Calais people seem to be less dispairing, and Coal is kept up there at between 18 and 20 francs. Yet, viewed more generally, it does not look as though we had seen the lowest range of prices yet.

BELGIUM.

(*Le Commerce.*)

BRUSSELS, April 4, 1874.—*Iron.*—We had last year early in April quite a brisk trade in Iron; this year the picture that presents itself to the impartial observer is a different one; yet the aspect might be worse. There is a decidedly better tone observable; the immediate future seems less threatening than what it appeared but a short time ago, although still far from reassuring. Rails keep steadiest, and are pretty well sustained at 240 to 250 francs. Sheet Iron is doing tolerably well, too, and the rolling mills are not devoid of a certain degree of animation; some from among them have gone into repairs, and are extending their productive capacity, a sign that they expect a heavy business. Liege is getting a good many orders, although moderate in size; some furnaces that had been extinct are getting under weigh once more. At Charleroi a good deal of discontent is manifested. Luxembourg is still under a cloud. *Coal.*—The Belgian markets are flat, and will remain so till the Iron trade begins to revive on an extensive scale, with assurances that it will remain so for some time to come.

HOLLAND.

(*Koch & Vlierboom.*)

ROTTERDAM, April 7, 1874.—*Tin*—The following items show the present statistical position of the metal as compared with last year:

STOCK ON WARRANTS WITH THE TRADING COMPANY.

	1874. Banca.	1874. Bilt'n. Slabs.	1873. Banca. Slabs.	1873. Billiton Slabs.
	122,006	2,867	133,509	200
Deliveries—Jan. 1 to March 31	34,977 Piculs.	300	22,701 Piculs.	1,731
Afloat	4,450		23,626	
Private stock	21,353			4,833

Tin is in a dull mood. Banca, auction paying conditions, has been ranging 53¾, 53 and 52½; from the May sale 52¾, 53, 52 and 51¾; from the July sale 52 and 51¾; Billiton, spot, has been done at 50½ guilders the 50 kilos.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(*From our Regular Correspondent.*)

SHEFFIELD, Eng., April 8, 1874.

THE GREAT WAGES QUESTION

still hovers over and around us, and is, for the time being, the terrible *bete noir* of the whole nation. Without any desire to soar into the regions of Carlylese philosophy, I cannot avoid the reflection, which comes to one intuitively, that these widespread disputes between capital and labor invariably break out simultaneously and, of necessity, spontaneously, seeing that there is no combination whatever between the employers in one trade and those in another. Are strikes a disease which, like some ordinary zymotic ones with which we are acquainted, travels in the air and is spread broadcast on the wings of the wind? Seriously, such would almost appear to be the case. From John-o'-Groats—and even farther north than that—to the Landsend, the whole country is passing through the throes of a gigantic struggle which should, when it is concluded, be of no little permanent advantage to the trade of the kingdom. On the whole, matters are somewhat brighter than when I last wrote, several great strikes being in process of arrangement. For instance, the Scotch miners, acting on the advice sensibly and prudently given by Mr. McDonald, M. P., have resolved to return to work at the reduction of 20 per cent., which they had previously resisted. They will, however, stoutly fight against any attempt at a further reduction. About 15,000 miners are yet out on strike in South Staffordshire, but a dispute in North Staffordshire has been averted. In the iron trade, arbitration has been agreed to which will probably prevent an open rupture. There are numerous struggles of considerable importance here and there, but I shall not enumerate other than that of the Sheffield razor forgers, the whole of whom turned out on strike today. These men are paid by the day, and have to forge a certain number of blades for a day's work. They had asked for an advance of five pence *per diem*, and being refused they have struck. Stocks are reported to be on a small scale, but as trade is not above an average in this branch, I shall not be surprised to see the men give in. The *Engineer* has an interesting article on "capital and labor," from which I select the following remarks:

"It is evident that a great struggle has commenced between capital and labor. The conflict is for the moment confined to limited districts. It is but an affair of outposts—a matter of preliminary skirmishes; but this cannot last. The country is threatened on the one hand by a general strike in the coal and iron trades, and on the other with a universal lock-out. It is almost certain that this contest will end, as all such disputes have done hitherto, with a fresh adjustment of wages and prices, followed by an armed peace; but there is every reason to believe that the impending struggle between men and masters will be attended by very unhappy conditions, and that much suffering and considerable loss to the nation will be the ultimate result. For many months past things have been very pleasant for the working man in England and Scotland. Iron and coal were eagerly purchased by other nations, and trade, for reasons not easily explained, perhaps, was exceptionally vigorous. We have no doubt that the stories told about colliers drinking champagne and buying pianos are perfectly true. There is no reason why colliers should not drink champagne, and the cultivation of music is highly commendable in itself. Unfortunately, however, there are still in existence colliers and ironworkers who do not care for champagne, and manifest no special predilection for pianos. These men work longer and earn lower wages than Englishmen and Scotchmen. They work in Belgium, which is not very far from England; and, as a result of the moderate demands of these men, Belgians are selling iron in Staffordshire more cheaply than it can be made there; and it is quite certain—in fact, it is indisputable—that unless wages undergo some adjustment, either here or in Belgium, it will not pay to make iron in Staffordshire. The question is, will wages rise in Belgium or fall in England? This is an extremely difficult problem to solve; but the moment English workmen get hold of the subject by the right handle a step at least will have been made toward a satisfactory termination to what promises to be a very disastrous and lamentable movement; and we think masters will do well to place the facts before the men, and so enable them to act on some rational basis. The theory held by all workmen, except a very few of those who are really educated, not instructed—there is a wide and deep gulf between education and instruction—is that capital is antagonistic to labor. The men have determined that they are not only quite as good as the masters, but a good deal better, and the very fact that the old idea involved in the terms "master" and "servant" has not yet become totally obsolete, lends all the more strength to what is practically a new theory in Great Britain—namely, the sentiment of equality which is impressed in the heart of the modern working man."

The article then banteringly alludes to the position of the consumer, who is never thought of by either masters or men, and sarcastically suggests that Parliment should be asked to prohibit the use of Belgian iron in this country, and the United States, Russia &c., should be induced to admit British iron free, "or an universal strike might," says the writer, "be organized!" He concludes thus: "The very best thing that the men can do at this moment is to organize among themselves two or three expeditions to various coal and iron districts in France and Belgium. Let the men who go on these expeditions be carefully selected, men of observation and some enlargement of mind. Let them report on what they see and hear in Belgium and France, and we venture to state that if the great masses of working men will but attend to what the excursionists tell them when they come back, we shall have no strike in the coal and iron districts of this country of any importance. It has often been urged that ignorance is a source of much evil in the relations of labor and capital. True, but the ignorance is not of a kind that can be wholly removed by books. If our colliers and ironworkers could see for themselves what Belgian colliers, and coalpits, ironworks, and ironworkers are like, much good would be done, and a solution might yet be found for the whole strike question. At any rate, some arrangement might be made by which all the evils proper to labor disputes would descend on the consumer, a consummation devoutly wished for by all parties except the consumer."

THE PRICE AND SUPPLY OF COAL.

Coal is still accumulating in stocks at the pits, and is, as a necessary sequence, falling in price in all parts of the kingdom. There is every reason for supposing that it will continue to do so, and present indications lead to the confident supposition that prices will fall to as low a point as was current at any time prior to the panic, which began a couple of years back. As the London *Times* very appropriately remarks, the late high prices were unnatural, and could not possibly be expected to continue. Those who then profited, must now be content to see their profits decline. "Already," says the *Times*, "much of our national trade has been lost. High prices cannot easily be reconciled with flourishing commerce. We commanded the markets of the world simply because we supplied them with the best goods at the smallest cost." This is the simple, "plain unvarnished" fact, a fact which cannot be gainsaid by all the unctious wisdom of the whole world's army of political economists.

THE BRITISH IRON AND STEEL INSTITUTE.

It has, I understand, been decided to hold the annual meeting of the Iron and Steel Institute of Great Britain in London, during the first part of next month (May), when various subjects of utility and interest connected with the science and practice of iron and steel working will be discussed. At the termination of the usual business the place for holding the autumnal meeting of the institute will be chosen. The United States being now out of the question, Barrow-in-Furness, or North Staffordshire, will, in all probability, be selected. You are, of course, aware that Mr. Isaac Lowthian Bell is the president of the institute, which now numbers over 600 members.

THE SCOTCH IRON TRADE

is unchanged. Prices are flat and weaker, as will be seen by the annexed quotations: Gartsherrie No. 1, 90/; No. 3, 85/; Coltness No. 1, 92/6; No. 3, 85/; Summerlee No. 1, 90/; No. 3, 83/; Langloan No. 1, 90/; No. 3, 83/; Calder No. 1, 90/; No. 3, 83/; Carnbroe No. 1, 87/6; No. 3, 85/; Monkland No. 1, 85/; No. 3, 83/; Chapelhill No. 1, 90/; Shotts No. 1, 90/; No. 3, 88/; Wishaw No. 1, 90/; No. 3, 85/. Shipments continue to decrease, being 1000 tons below the corresponding week of last year. The make of pigs is, of course, greatly reduced, owing to the many furnaces which have been out of blast,

but stocks are large, and, as the miners have "caved in," the furnaces will probably be set to work again at once. During the strike it transpired that the cost of making a ton of Scotch pig iron is as follows;

38 cwt. blackband and clayband, at 33/ per ton	£3	2	8½
54 cwt. coal, at 10/ per ton	1	7	0
10 cwt. limestone, at 6/ per ton	0	3	0
15 cwt. dross for heating stoves and blast engines	0	2	3
Wages of furnacemen, keepers, &c., horses, locomotives, repairs to furnaces, interest, depreciation, &c	0	10	0
Cost of making a ton of pig iron	£5	4	11½

This proves very clearly that many of the Scotch ironmasters have lately been selling at a clear loss of 10/ to 15/ per ton.

SHEFFIELD.

There has been little or no change during the week in the general condition of business here. In the steel trade matters are certainly no better, but—if there be any consolation in this—no greater slackness is to be noted. Many even of the leading steel firms are not using the whole of their producing capabilities, but are content to let some of the melting and converting furnaces remain idle. It is further noticed that even the principal concerns appear to have an insufficient amount of work to keep the whole of their rolling and other machinery at work. But, on the other hand, there is a very excellent demand for steel wire of all sizes—for fencing, colliery winding, telegraphic, music and general purposes. This, indeed, is well demonstrated by the monthly Board of Trade returns. One or two works here are turning out as much telegraphic wire as they possibly can on account of the British, Indian, and other governments. In isolated instances a better trade is just now doing in iron rails for colliery, tramway and railway purposes, orders having been secured by a judicious and timely reduction in prices. The steel rail manufacturers are not able to report any material accession of orders of late, but they appear to believe that a good future is in store for them—if recent advices from Australia, Egypt, Russia and the United States are to be relied upon. In the last case stocks are stated to be exceedingly low throughout the whole country, and many important railroad enterprises have been postponed by reason of the financial panic and the general depreciation of railroad property. It is thus hoped that in a few months hence a strong demand may arise.

Neither Swedish nor Yorkshire iron is lower in price. Swedish charcoal bars are £18. 10/ to £19, and pigs £8 to £8. 10/ f.o.b. Gothenburg, with little likelihood of reduction, seeing that the mild winter has so greatly retarded the production. Lowmoor flat bars are held at from £24 to £25; rivet iron, £24; boiler plates, £29 to £30; sheets, to 17 w. g., £31 to £32; strips, £31; and tires, £26. 10/; hoop, £29; and ordinary railway axles about £24. 10/ per ton. Common Yorkshire bars are to be had at from £12 to £13; good ditto, £13. 10/; and Staffordshire at from £11. 10/ to £14. There is little or no movement in any description of finished iron, and but few transactions are recorded in ores (British hematite) or ironstone. The former ranges from 25/ to 37/ per ton. Pig iron is in fair request for foundry purposes, that quality being quoted at £4 per ton. Good Yorkshire No. 1 is to be had at £4. 7/6 to £4. 10, or thereabouts.

Cutlery is not more active. Some few firms are doing fairly in best qualities of table knives, razors and fancy goods, but, on the whole, there is no improvement. Stocks are reported to be heavy, and unless a genuine demand soon sets in, some makers will be prepared to throw large lots into the market at a considerable sacrifice. There have been a few large consignments sent to Africa and the West Indies during the past few weeks.

BELGIAN IRON IN ENGLAND.

Mr. J. Wilson Browne, a Birmingham merchant and agent, has issued a circular, of which the following is a copy:

"BIRMINGHAM, April, 1874.—I beg to call your attention to the present low price of Belgian iron, as compared with the same class of iron of English manufacture. I am now able to offer, without engagement, bar iron and iron wire at the prices noted below. The three qualities of bar iron correspond with our common Welsh, ordinary Staffordshire, and best Staffordshire. The prices are quoted f. o. b. at Antwerp, and freights from London to Liverpool, including insurance, vary from 5/ to 12/6 per ton; but for good orders the prices quoted in Antwerp would probably cover delivery in England. I am expecting shortly a few tons on which to try experiments for the purpose of testing the quality. Bar iron No. 1, £9. 10/; No. 2, £10; No. 3, £10. 10/. Iron Wire—Nos. 1 to 6, 7/6; No. 7, 7/10; No. 8, 8/2; No. 9, 8/8; No. 10, 9/2; No. 11, 9/8; No. 12, 10/2; No. 13, 10/10; No. 14, 11/6; No. 15, 11/8; No. 16, 12/6 per bundle of 63 lb. net cash, f. o. b. Antwerp." After this, who will doubt the commercial enterprise of our redoubtable neighbors over the water?

TRADE OF BIRMINGHAM AND STAFFORDSHIRE.

Manufacturers are stated to be fairly busy on old orders for fancy goods and certain kinds of hardware at Birmingham, there being also a good business doing in brass and copper ware. Cabinet brass founders are fully engaged, and the makers of carriage and railway lamps are well supplied with orders. The electro platers are experiencing a moderately good home and colonial inquiry. There is a good demand for hollow ware. On tinned and enameled hollow ware an increase of discount of 5 per cent., with a reduction of 7½ per cent. on net prices, have been conceded. The gun and ammunition branches are dull, although the small arms factories are busily engaged on English and German government contracts. The American demand for cheap birding guns is very small; neither is there any improvement in other directions. The iron trade proper of the locality is still in an unsettled, unsatisfactory condition. Business is almost at a standstill, and in consequence of the labor disputes production is being limited by the damping down of blast furnaces. Over thirty of these have already been let down. Few of the forges or mills are making more than half time in any part of the district under notice. Yet, on the whole, matters are regarded as being more hopeful than they were considered to be a fortnight back—a view based upon the prospect of an amicable settlement of the wages question being arrived at to-morrow, at a meeting of both sides to be held in London. Prices are wholly stationery, best bars being nominally £14. As a matter of fact, however, few transactions are on record for some weeks past at a higher price than £13, the *average* being, in all probability, something under £12. The sudden competition of the Belgian makers has had the effect of bringing down inferior bars to £11, about 10/ above the price of Belgian bars delivered in Birmingham. Cold blast pig is worth £7. 5/, and cinder, £4. Other kinds of finished iron are priced the same as when last alluded to.

SOUTH WALES.

There is no great amount of new business in South Wales, and old orders, held by a few large establishments only, are gradually becoming of exceedingly attenuated proportions. Dowlais has sent a few cargoes of rails to Russia, and Nantyglo and Blania, as well as Rhymney and Tredegar, are fairly busy, but with that enumeration the list is closed. The dispute with the workmen in the tin plate trade is growing more and more serious. Several large works are closed, and others will follow suit as soon as the notices shall expire. At Llanelly a large number of men are out of work. Throughout the whole district the men appear fully as determined as the employers, consequently a lasting strike is threatened. The colliers are limiting the output in the belief that by so doing they will uphold prices, and so prevent a reduction in their own wages. In spite of this the inquiry is small, and the export as well as house trade is of a restricted nature. It is understood that the ironmasters are securing a few rail orders at very low prices, in order to keep the works going, and to prevent their old customers from being led to give out orders to makers in other parts of the kingdom. They do *this* at a loss of several shillings per ton on every ton of iron produced.

METALS.

The metal market is depressed, and, in most instances, prices are lower on the week. Copper has been dull, G. O. B. Chili being sold at £74 to £74. 10/, for cash. Wallaroo is £85 to £86; Burra, £83. 10/ to £84; English tough ingot, £84 to £85; selected, £86 to £87, with a quiet market. Tin is also weaker, Straits being £87 to £90; £87 for arrival. Australia is held at £85 to £87, while in Holland Banca is on offer at 53 fl. and Billiton at 50 fl., with no response. English common ingots are £90 in London. Lead is steady at £21 for soft pig; L. B., £21. 5/ to £21. 10/; and soft Spanish, £20. 5/. Spelter is quiet at the nominal figure of £22, whilst Quicksilver remains at £19. 15/ to £20. Tin plates are but nominally quoted, despite which they are firm and likely to remain so in view of the dispute with the workmen bringing about a great reduction of the make. Messrs. French & Smith thus refer to the London metal market: *Copper.*—This market, although at one time during the past month showing considerable firmness, has been unfavorably influenced by the general stagnation in trade, coupled with the news of full supplies from the West Coast. Prices have given way about £3 per ton, and we now quote: Chili bars, £75; Wallaroo, £86; tough, £85; manufactured, £94 to £95; ore and regulus, 15/. Tin has steadily declined during the month, the large supplies from Australia still pressing heavily on the market. The unfortunate differences between masters and men in the tin plate trade in South Wales have also a depressing effect. It is impossible to forecast prices from day to day, as there is almost a panic in the article. Tin plates quiet, but prices steady. As most of the works are closed in Carmarthenshire, and Glamorganshire will probably close for the most part in ten days or a fortnight, owing to differences with the workmen, the make will be much diminished and prices will be firm. *Lead.*—The price of this metal is flat, owing to the stagnation of business. Spelter has declined to £22 per ton. Quicksilver is firm at £19. 15/.

Messrs. Von Dadelszen & North's monthly metal circular says: *Copper* has been extremely inanimate throughout the month; at one time there was a temporary rally, and £79 was paid for G. O. B. Chili, but from this the price has gradually declined to £74. 10/, which is our present quotation. The general disinclination to operate has rendered it impossible to sustain prices when there has been any necessity to realize, and hence the unsatisfactory state of the market. The delivery last month was good, that of Chili amounting to about 4300 tons, and of Australian to about 700 tons, but the total amount of stock arrived and afloat shows an increase of 2000 tons. The Chili charters for February are given as 4560 tons, which is above the average. Australian, after advancing to £89, cash, has declined to £85, at which Wallaroo was sold yesterday, and Burra at £84. The quantity of Australian afloat is given as 1000 tons, and 1000 tons arrived, but not landed. English copper has been moderately active, but at present there is great dullness; tough quoted £85; best selected, £86 to £87; Indian sheets, £93; manufactured strong, £94. Yellow metal has advanced ¼d. per pound. *Tin.*—The increased supplies of Australian tin and tin ore, of which advices reached us last month, and the imminent prospect of a general lock out among the tin plate workers of South Wales, had a further depressing effect upon the market, and prices have still further declined.

The fall in Holland has been even heavier than here, being hightened first by the sale which took place on the 25th, when 19,400 slabs of Banca and 3100 of Billiton were thrown upon an extremely sensitive and weak market; and, secondly, by public attention being called to the position of Billiton, which, on the eve of a fresh sale in Batavia on the 9th instant, shows the unprecedented cypher of 56,220 slabs arrived and afloat, or, say, 1800 tons. The amount of business has been confined to consumption and export; speculation, there is none whatever. Holders have been willing to supply daily requirements at daily reduced quotations. The fall in the price of Billiton has been quite £17 per ton; of Banca, £14; of Australian, £9; of Straits, £7; and of English, about £12 per ton. The Banca sale realized an average price of f. 5535, equal to £96, delivered here, and the Billiton f. 53½, equal to £92, showing a fall of about £25 a ton as compared with the price realized on the 28th of January, when the average was f. 70¼, say £120·10/ delivered here. But even at this reduction the price was too high, for sellers came out the next day at two florins below the average paid in the sale, without attracting buyers. The market has been flat and drooping ever since. Banca being obtainable at £91, and Billiton at £86. The deliveries, both here and in Holland, have been very large, amounting to hard upon 1400 tons; but should the works in South Wales continue closed, we must expect a considerable reduction in our home consumption. The shipment of Straits for March are only about 300 tons for Europe; but the stocks in Penang and Singapore, already exceptionally large, show a further increase, and sooner or later will probably find their way to England. At present the price stands in the way, that ruling in the East being much above our quotations here. The stock of tin in the island of Banca is much the same as usual, being on the 31st December, 1873, 126,490 slabs; but the quantity of Australian tin afloat, in ore and metal, is excessive, being estimated at 2500 tons. At the sale of Australian ore on the 17th March, 22 tons were withdrawn and 84 tons sold at £37. 10/ to £55. 10/ per ton, and few tons of good Peruvian realized £47. 15/ per ton. The English smelters have met the market freely, and as the demand has been good, their stocks must have been considerably reduced. There are no official prices now, but we quote English L. and F. ingot £90 to £92, and bars £91 to £92. Our closing quotations are as follows: Straits, on the spot £87 to £88; forward £86; Australian, on the spot £85; forward nominal, Banca, in Holland, f. 53, seller's spot f. 52 forward; Billiton, f. 50, spot and forward, *Tin Plates.*—The anticipation of a lockout in South Wales, which now appears to be an accomplished fact, has rendered the trade very uncertain, but a fair business has been done. How long the present state of things may last it is difficult to say, but the whole question is of such a character that it will probably extend to the Monmouthshire district, and may materially alter the relations between masters and men. The usual quarterly meeting is to be held in Liverpool on the 7th instant, instead of Newport. *Lead.*—The London market has been very flat and declining, although the trade in itself is fairly active. Our quotations are about £21 for good, soft English pig; L. B., £21. 5/; soft Spanish, £20. 5/. *Spelter* has been dull and again declined in value, £22 being the nearest quotation for Silesian. The stock in London is reduced to 135 tons, and in outports to 750 tons. *Quicksilver* has ruled between £19. 10/ and £20. *Swedish Iron* has sold in small quantities at about £18. 10/.

The Stopping of Mining at Port Henry.

56 BROADWAY, NEW YORK, April 20, 1874.

To the Editors of the Iron Age: GENTLEMEN—You have been misinformed as to the reason for the notice to the employes of Messrs. Witherbees, Sherman & Co. and the Port Henry Iron Ore Co., published in your last issue.

The miners have not resisted a reduction of wages, nor have they given any intimation that they would do so. The very high wages, $2·60, were fixed in prosperous times, with an assurance that they would be continued one year. Notwithstanding the great change in the times, we have continued to work the mines and pay the wages, because good faith required it. The year expires on the 30th inst. In determining whether we should continue work or not the amount of wages did not enter into the consideration. If we had decided to continue work, I have enough confidence in the good sense of our men to be entirely satisfied that they would have cheerfully consented to a material reduction. But the fact is, that we have now nearly 80,000 tons of ore on our dock, and Messrs. Witherbees, Sherman & Co. have nearly as much more. From present appearances this large accumulation is abundant to meet the demands of the market for the entire season. As soon as we see signs of the improved condition of things, which we are all hoping for, we shall name a rate of wages which we are willing to pay, and the men can accept it or not, as they please. What that rate will be we have not yet considered. It will be time enough to do so when we see encouragement to resume work. When that time comes we shall be just and fair toward our men, and we have no doubt they will be entirely satisfied. Respectfully yours,

J. B. BRINSMADE,
Treasurer Port Henry Iron Ore Co.

The British Coal and Iron Trades.

The London *Times* says:

It was certainly not to be expected either that the prices of last year could be maintained or that they could fall without producing the controversies now witnessed. The men doubted whether they ever got their full share of the exceptional profits of 1873, and they are now afraid of getting more than their share of the losses in 1874. On the whole, however, there appears to be a disposition to come to terms, though the Wigan colliers, it is evident, have not yet mastered the true principles of the subject before them. By reducing the hours of labor to thirty-two in the week, they hope so to limit the production of coal as to maintain present prices, if not to force them up still higher, the next assumption being that if they can succeed in this, they must succeed also in maintaining the present, or obtaining an even better rate of wages. They have not yet learnt that the value of their labor depends upon the supply of the commodity at the command of the employers, and cannot be regulated by the output of coal. It is quite true that in the winter before last as prices advanced the working colliers did contrive to obtain corresponding, if not proportionate, advances in their own wages, so that the earnings of the men appeared to vary with the market value of coal. But this was because the demand for coal had increased while the supply of skilled labor to bring it to the surface was limited, and miners were thus enabled to command their own terms from their masters, as their masters were from the public. More labor has since been brought into the market, just as more mines have been opened for the production of coal, and neither colliery proprietors nor working colliers can escape the consequences of the change. Coal falls in price, and wages are reduced—none too soon, indeed, for the interests of the public. No combination, either of masters or men, can struggle against the operation of economical laws, though it is perfectly natural that disputes should occur in the apportionment of sacrifices to be made. It is a wonder that we got through the coal famine even as well as we did, but the derangement of some industries and the charges imposed upon others were prodigious. In the report of the North British Railway Company it was stated that the annual consumption of coal on the line was 240,000 tons, and that the price paid for this fuel had been almost trebled. In domestic life the expenditure was heavily felt. Of course, we all practiced economy as well as we could, and the silver lining of the cloud may, perhaps, be hereafter discovered in a better appreciation of the importance of our coal supplies. But for the famine itself there was no good cause. Our coal mines were not exhausted, nor approaching exhaustion. The difficulty of raising the coal had not materially increased, and the rise of wages, as the men declare, followed, instead of preceding, the rise in market prices. The whole thing was the result of a sudden pressure, and an equally sudden panic. The iron trade, being largely inflated, made extraordinary calls upon the coal mines; the long strike in the South Wales collieries checked production, and presently the supply became, or was expected to become, unequal to the demand. Offers of higher prices then came from the consumers themselves. Agents, afraid of not being served at all, bid above their neighbors on condition of being served first, the coal owners naturally avail themselves of the advantage, and then the public took the alarm, and the panic became general. Gradually, however, the truth of the case was discerned, and, what with economy, patience, and the help of an unusually mild winter, we have got through to Easter with less suffering than might have been anticipated, and with pleasanter prospects before us.

Neither masters nor men can fail, we trust, to apprehend the nature of their present position. A coal famine cannot, with coal stocks in abundance, be permanently maintained. Prices will probably never again fall to the level of six years since, but neither can they be kept at the elevation of last year. It was an unnatural state of things, and those who profited by it must be content to see their profits decline. The dispute, as we have said, concerns the division of losses, but that must be determined in the long run by the relations of demand and supply. If there is a dearth of labor, the men will hold their own; if otherwise, they will have to give way. The result cannot be permanently affected by any limitation of the out-put of the mines. It would require an impossible combination of interests to produce this artificial scarcity, and the end, if it could be secured, would be disaster. Already much of our national trade has been lost. High prices cannot be easily reconciled with flourishing commerce. We commanded the markets of the world simply because we supplied them with the best goods at the smallest cost, and when our wares are no longer cheap they will no longer find a sale. Just now we learn that the Staffordshire iron trade is seriously threatened, and that the foreign orders usually coming in at this season of the year are likely to be lost. Belgian competition in finished iron is, we are told, extending, and it is well known that the Americans have availed themselves of our recent difficulties to become their own providers. These results were inevitable. Whatever "internationalism" may do in the future, it will certainly not in our generation prevent these displacements of industry and trade. Dear coal must mean dear iron and dear manufactures of many other kinds, while dear goods bring slack business, and slack business limited employment. It is to be hoped that, with such long experience of trade quarrels as we have now had, employers and employed may be induced to make the best rather than the worst of things as they now stand. They have had a pretty good spell of prosperity at the public expense, and must forego some of their late gains. We do not affect to blame them for taking advantage of opportunities which in the main were created for them by others, but the fact remains that there was really no warrant for the late price of coal. Coal owners and colliers must submit to the reaction which, sooner or later, was sure to occur, and it will be better for them, as well as for us, if they can come to some pacific arrangement for apportioning the losses impending.

Mr. Samuel J. Reeves on the State of the Iron Trade.

A *Tribune* correspondent sends the following to that journal as a summary of the views expressed by Mr. Samuel J. Reeves, of Philadelphia, president of the American Iron and Steel Association:

Mr. Reeves says that there is undoubtedly great depression in the iron trade, and this is largely or mainly due to the financial question and the recent panic. The ironmasters are greatly disheartened by the failure of Congress to settle the vexed question of the currency. They say that any settlement would be a relief, provided it be final. The leading manufacturers, however, favor all financial schemes before Congress which look to an increase of currency. The condition of the iron trade in Pennsylvania is as bad as it can be.

The works at Phœnixville have been particularly fortunate, for the reason that they had large contracts, which afforded work through the panic and up to the present time. They have had two blast furnaces idle, but have used the production of three or four of other people's to supply their works. Their own were put out of blast at the commencement of the puddlers' strike in May last, but the men came back after six weeks' idleness, and signed an agreement not to belong to any union whatever. The Phœnix Company have sufficient ore on hand to run the furnaces now idle for six months, but they can buy the stock of pig iron of other furnacemen in the neighborhood as low as they can produce it themselves, and probably lower. Therefore there is no reason why they should put their furnaces in operation while they can buy that manufactured by others at less than it would cost.

Mr. Reeves further says: Manufactured iron of all descriptions is a perfect drug in the market. The demand is less now when most expected a demand than it was three months ago, and there is no sign of improvement. His company laid in a heavy stock, expecting that things would be in the normal condition about this time, but it has not turned out so. The iron trade has not been so bad for 15 years, and he looks for no improvement till next fall. As to the strike, which it is stated is contemplated, he does not believe it will occur; and if it should, it will be regarded by the manufacturers with indifference, if not approval. The mill owners of Pennsylvania would not be damaged by a universal strike, because they are now running their works at a loss.

The mining interest is identical with that of the mills; mining falls off in proportion to the demand. There is now no demand, and the mine owners would not run the mines at all but for the necessity of keeping the water out. This depression is not new, but it has existed and increased since last November. The orders on hand kept the mines and mills running for two or three months after the panic, but now these sources of work are being rapidly exhausted. This is seen in a qualified degree in the case of the Phœnix Iron Company. There has not been a day's cessation of labor at their works since the panic, because they had large contracts made before it began, but it begins to look "squally" now, as but few contracts have been made. The two blast furnaces which have been idle employed, say, 200 men, and the hydraulic shop stopped a week ago for want of orders. Mr. Reeves fears this course will have to be adopted still further for the same potent reason. The case of the Cambria Iron Works, at Johnstown, of which he is a director, is one in point. Several weeks ago the men put up a notice that they would hold a meeting with a view to striking for an increase of prices, but until the details should be settled, "work would continue as before." The action of the men in striking was at once anticipated by the foreman, who shut down the works, and the men were out for several weeks. Last week, however, they resumed work at the old prices, and under the condition that they should be non-union men. This is the case, also, with the Duncannon Works, in the same district.

The Zero Refrigerator.

The necessity of rendering the air of receptacles in which meat and vegetables are to be preserved as dry as possible, deserves to be widely understood. In some climates, as in South American countries, parts of Texas and California, and in special localities where a naturally dry atmosphere prevails, articles of food are kept without the aid of the refrigerator and with little trouble. Generally, however, in the climate of the United States, moisture is present, a circumstance plainly exhibiting itself by the condensation on the cold surface of pitchers containing ice water in summer, or on the exterior of the window panes of warm rooms in winter. Hence the refrigerator is a most essential article with us, and its interior arrangement should be such as to render its contained air much less humid than the outer atmosphere.

It needs no argument to prove the dampness present in single compartment refrigerators, and from their close earthy smell, the mingling of odors within them, the neglect of servants to keep the blankets used to cover the ice perfectly clean, and from similar defects, their sanitary value is at best questionable. In receptacles where the ice is in one division, and the articles in another, a point of advantage is aimed at; but, clearly, if the moisture in the food compartment be allowed to condense on the cold surface of the ice box, and then to flow back on the meat, etc., the object sought is not secured.

In the Improved Zero Refrigerator, manufactured by Mr. A. M. Lesley, of 224 and 226 West Twenty-third street, in this city, the ice blocks are placed upon a wooden tray, through which the water runs to a charcoal filter, which covers a small central compartment. This gives a supply of pure ice water, which may be drawn off by the faucet. The moisture condenses upon the surface of the ice box adjoining the food receptacles, and thus leaves the air in the latter in an almost dry state. It then runs to a trough, and thence is conducted to a pan located under the apparatus, by a pipe, in which a trap or siphon is placed so as to prevent an escape of cold or an influx of warm air. On top, and beside the ice box, is a receiver for wine bottles, milk, etc. Each compartment has its own door, so that access may be had to any one without disturbing the others, and hence no warm air gets to the ice except while the supply is being replenished. The inventor states that moisture is never seen on the inside lining, and that the provision chambers are always sweet and clean. Matches, we are informed, which absorb dampness readily, have been placed in the refrigerator, as a test, without injuring them in any wise. The consumption of ice is claimed to be remarkably small.

The zero refrigerator is constructed of seasoned lumber, filled with cork, lined with zinc, and is provided with a galvanized iron ice box.

A Columbus correspondent says: The three principal Iron markets the furnace men of this section have to compete with are Pittsburgh, Cincinnati and Cleveland. I will give the present market quotations of these places, so that they can be compared with those of Columbus. These prices include the usual four months' credit:

	Pittsburgh.	Cincinnati.	Cleveland.
No. 1 F'dry	$32·00@34·00	$33·00@36·00	$34·50@35·50
No. 2 F'dry	30·00@31·00	— @ —	33·00@34·00
No. 1 G. F.	27·50@29·00	— @ —	30·00@31·50
No. 2 G. F.	27·00@ —	— @ —	29·00@30·00
Ohio Forge	— @ —	30·00@31·00	— @ —

The markets at the above points are represented as being in a very depressed state, with everything in buyers' favor. And with all this staring us in the face, I learn of two more furnaces that will be erected during the present year, about two and a half miles from Straitsville. The stacks will be 48 feet high, 12 foot bosh, and supplied with four 3¼ inch tuyeres, through which will be forced a hot blast. The product of these two furnaces will be brought to this city, where it will enter into direct competition with the furnace men here.

Messrs. John E. Swan & Bros., of Glasgow and Middlesborough, announce that they have registered their firm under the British "Companies Acts of 1862 and 1867," as an incorporate company, under the style of "John E. Swan & Bros., Limited," with the members of the old firm as directors, and that Mr. George Rae Anderson, iron merchant, of Glasgow, and Mr. Robert Summerside Simpson, who formerly occupied a confidential position with them, have been appointed managers at Glasgow and Middlesborough.

The troubles of the Cambria Iron Company with the men in their employ are approaching a satisfactory termination. The company have maintained a firm determination to yield nothing upon compulsion, and the men are abandoning the unions. This is the best thing they could do in any case.

The Centennial Exhibition.

To the People of the State of New York: It is right that the people of the United States should know that the day and year which closed the century of American Independence—July 4, 1876—will be commemorated with ceremonies expressive of the gratitude and pride of a great nation; and in accordance with the act of Congress of June 1, 1872, which created the Board of Finance, the following report is made over the signature of the President of the Board:

The original law of Congress, enacted March 3, 1871, provided for "the celebration of the Centennial of American Independence by an international exhibition of the arts, manufactures and natural resources of this and other countries, under the auspices of the government of the United States."

And the act of June 1, 1872, fixed the capital to complete this great commemoration at $10,000,000, which was by the commissioners apportioned among the several States and Territories on the basis of population.

Of this sum the State of Pennsylvania alone, aided by a subscription of $100,000 from the State of New Jersey, has raised in the form of subscriptions to the stock and by appropriations from its legislature and the councils of Philadelphia, about $4,000,000, or nearly one-half the amount necessary to insure success. This provision having been made, designs for suitable buildings were approved, and other preliminary and incidental arrangements have so far advanced as to justify an immediate commencement of the work of construction.

The commissioners have appealed to the Congress of the United States, on the basis of these subscriptions, appropriations and preparations, to maintain the spirit of the two laws above referred to, and the correspondence of the State department with foreign powers has induced the governments of the Netherlands, Belgium, Switzerland, Germany, Sweden, Liberia, Ecuador, the Argentine Confederation, Chili, Mexico, Hayti, and the Sandwich Islands to express their intention to participate, and they have every reason to believe that this appeal to Congress will be generally responded to.

Subscriptions to the stock have also been made by individuals in the States and Territories of Missouri, Illinois, Nebraska, Montana, Indiana, Nevada, Oregon, California, Louisiana, Florida, Maryland, Ohio, Wisconsin, Michigan, Arizona, New Jersey, Delaware, Rhode Island, Arkansas, Alabama, New York, Virginia, Iowa, and Kansas.

Such in brief is the condition of the organization for the international commemoration of the close of the century of American Independence.

The city of Philadelphia was selected as the most fitting locality at which to celebrate the birth of American Independence for the reasons:

1. That from Philadelphia the Magna Charta of human liberty, the immortal Declaration, was uttered. The buildings in which the convention sat remain substantially as they were on that historic day; and

2. Of all the points of revolutionary interest, Philadelphia is the most central and accessible to the whole country. It is the Republic's celebration of its birthday at the very place of its birth.

The finance board earnestly urge their fellow countrymen to keep in mind the great fact that the event to be commemorated is the grandest and most momentous in history, that the commemoration is to take the form of an exhibition of the stupendous progress made by the American people in the first hundred years of their independence, in everything relating to the natural resources of the country and their development, and especially its progress in those industries, arts, and institutions which benefit mankind.

How diversified are the objects which must enter into that exhibition—how vast the buildings and the space required to present them with full effect, are suggestions that need only to be mentioned to bring home to every American the colossal magnitude of the undertaking.

Consider for a moment the industries, products, and devices necessary to an adequate expression of the progress of your own State, and the space that will be essential to their full presentation, and you can hardly fail to perceive that your State alone will require an area in the exhibition buildings and grounds equal to that occupied at Vienna by England or France. This is true of not less than ten of the older States. The other twenty-seven States and ten Territories will each of them require space in proportion.

That the stock of the Centenial Board of Finance might be within the reach of every citizen, the Congress of the United States fixed every share at $10, which will be represented by a handsome steel engraved certificate, executed by the Treasury Department of the government, and fittingly designed in commemoration of the event. The Board in soliciting subscriptions to its stock feel assured that there is a patriotic desire to rende. the exhibition worthy of the occasion.

Notice is hereby given that checks and drafts can be addressed to the Financial Treasurer, Frederick Fraley, No. 904 Walnut street, Philadelphia, for any number of shares, at $10 each, and certificates of stock will be promptly returned. The International Exhibition will commence on the 19th of April, 1876, and close on the 19th of October, 1876.

The undersigned, President of the Board of Finance, speaking for his colleagues, and, he believes, for the great body of the American people, does not doubt the answer of that people to this earnest appeal. They are not unmindful of the patriotic interest in the Centennial of their own independence, nor of the high duty of honoring it as it deserves. Philadelphia, the scene of the immortal Declaration, not only in the old hall where it was written, and whence it was proclaimed, but in the extensive park where the exhibition is to be held, sacred as the resort of Washington and the revolutionary worthies, has given many times her share to the memorial. It is not her celebration—it is the nation's. History has simply designated that city as the spot where the national sentiment can be historically expressed. Every other city and State is inspired by the same sentiment. Every man and woman, North and South, is stirred by the same impulse. All the peoples of the earth are earnest spectators and students of our progress. The work, therefore, is at once national and international. It reaches every class and every interest. It will be the most remarkable comparison and interchange of ideas and inventions, of art and science, of the products of the earth, the brain, and the hands—the most friendly and complete intercourse between the races of all countries in modern civilization. It is impossible to believe that any portion of the American people will hesitate to unite in what is a sacred memory and a sacred obligation. JOHN WELSH,
President of the Centennial Board of Finance.

The Late William Resor.

We take the following from the tribute to the memory of Mr. William Resor, a well known stove manufacturer of Cincinnati, and a member of the Board of Managers of the National Association of Stove Manufacturers. It is signed by Messrs. D. B. Pierson, G. Gano, C. Olhaber and H. H. Tatem, committee of the Cincinnati Board of Trade:

Mr. Resor was the embodiment of honor, and by an unwavering adherence to strict business principles became the leading representative of the prominent branch of industry in which he was engaged, and as such commanded the unlimited confidence and respect of his associates, and won for him a reputation for prompt and honorable dealing as flattering as deserving.

He was public spirited in an eminent degree, and but few possess the faculty in applying themselves for the general good of the unostentatious manner which characterized the public acts of Mr. Resor. He became prominently identified in the work of this Board shortly after its organization. He served it faithfully and efficiently whenever his services were asked for, and at the time of his death was one of its representatives in the National Board of Trade. His liberality to the cause of education is a lasting memorial of his beneficence; and no more appropriate or enduring monument to his memory should be desired than the results of his efforts to beautify the surroundings of the city.

If true wisdom is vouchsafed to man at all, it is to those who, by constant application, discover great opportunities, and with ardent and animated resolution break through all opposition, that these opportunities may be improved. Herein Mr. Resor was one of the wisest of men. He recognized the insurmountability from his standpoint of no impediment, and never suffered the embarrassment of defeat in any project his judgment approved. Such a record as his is as rare as honorable, and furnishes the index to a life whose every detail should become the subject of careful study by those who really desire success.

He possessed the rare faculty of business courage in an eminent degree, and exercised it on all occasions. One of its most important results was realized in the unusual credit he extended to many young men without means, who had sought it elsewhere in vain. It is known that scores of good business men throughout the West owe their prosperity to the start and subsequent encouragement given them by William Resor, and no more eloquent memorial of the man can be written than that which is now inscribed within the grieved hearts of these sometime beneficiaries. Blessed is he who deserves it.

Mr. Resor was also an excellent judge of men, as well as affairs, and peculiarly happy in placing his trust where it was deserved. But a few months since he declared to an intimate friend that "there can be no better basis for business credits than young men who have faithfully learned their trades, bought and paid for the tools necessary in their chosen vocations, and married good wives;" and this sentiment unquestionably resulted from studious observation through a long business experience, for his practice in giving credits was founded upon it in a large degree. The principle it involves is worthy of such a man, and should be remembered not only as indicative of his sagacity, but of his benevolence.

The Origin of Electro-Plating.

The application of electro-metallurgy to the arts was an accidental discovery. In 1830, Mr. J. P. Wagner, of Frankfort, and Professor Jacobi, of St. Petersburg, were endeavoring to employ electro-magnetism as a motive power, instead of steam. Jacobi employed a Daniell's battery, which is distinguished for its constant and regular action. It consists of an outer cup of copper, and an inner cell of unglazed porcelain which contains the zinc rod. The intermediate space is filled with a saturated solution of sulphate of copper. When the battery is working, this solution of blue vitriol is slowly decomposed, depositing metallic copper, which finally becomes injurious, and must be removed. Once when Jacobi was busy with removing such a deposit from his copper cup, he noticed that there were several layers of copper, each having the form of the sides of the copper vessel, and hence, concluding that the sheet copper of which the vessel was made had split up into layers, he accused the man who made it of employing a poor quality of sheet copper. A closer investigation, however, showed him that these layers, or leaves, did not belong to the walls of the vessel, but to a new deposit of metal, which imitated, in a remarkably perfect manner, the shape of the surface of the walls. It occurred to Jacobi that this troublesome disadvantage could be turned to profit by using it for producing objects. In 1838 he communicated to the St. Petersburg Academy a description of his discovery of the use of galvanic electricity for reproducing objects in the arts.

The Emperor Nicholas requested a German chemist named Klein, who was then employed in the imperial printing office, to test the practicability of the discovery, and to ascertain to what extent it was capable of development. The answer being a favorable one, he gave the discoverer the means of making his new art the common property of the whole world.

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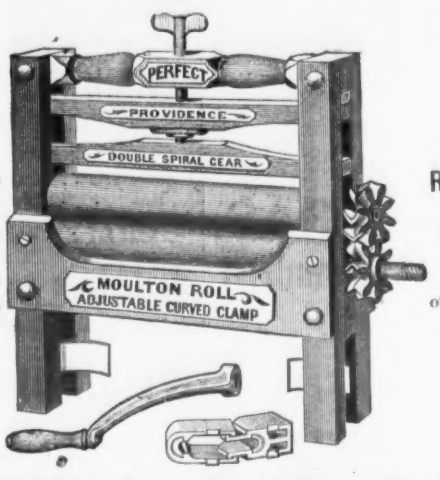

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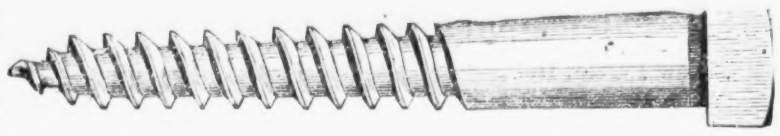

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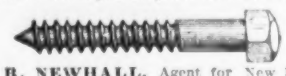

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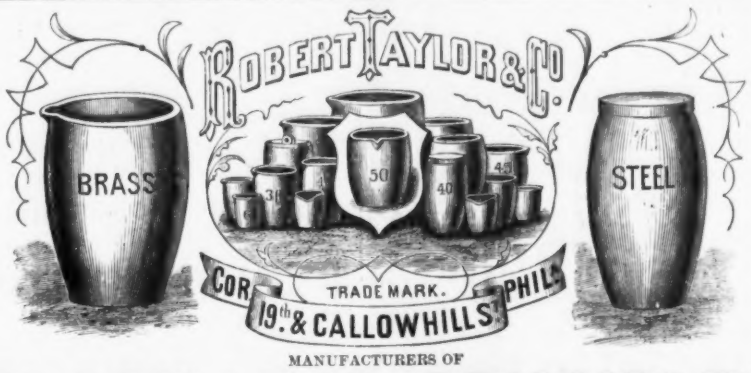

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Mr. Robert Taylor, who was for seven years the head of the late firm of Taylor, Strow & Co., and who is a practical mechanic, and familiar with all the details of the manufacture of Crucibles, attends personally to our manufacturing department. We would, therefore, respectfully solicit a continuance of the favors hitherto extended to him.

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Price of Empire, (14 in. cut) **$20.** Agents wanted in every Town.

Price of Monitor, (No. 0, 10 in. cut) **$15;** No. 1, (14 in. cut) **$20.**

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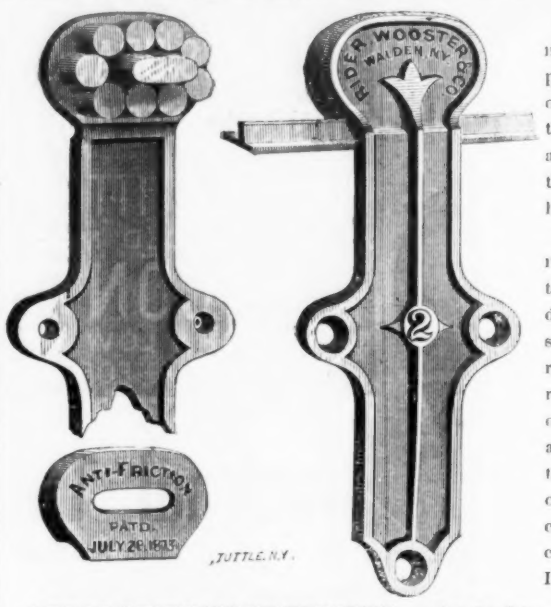

This Hanger is entirely new in principle and design, and possesses marked advantages over all others, entirely obviating all the defects and annoyances hitherto experienced in the use of ordinary sheaved hangers.

In construction it is exceedingly simple, as will be seen by the cut. The weight of the door is supported by a strong stud, between which and the rail is a series of chilled iron rollers, inclosed by the front of the hanger and cap, and as these rollers pass under the stud, they are returned over it in succession. There is consequently no friction, except that of rolling surfaces. Its leading advantages are:

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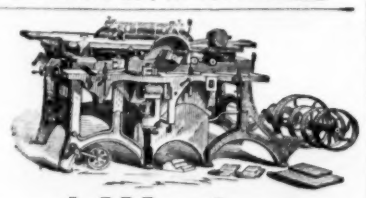

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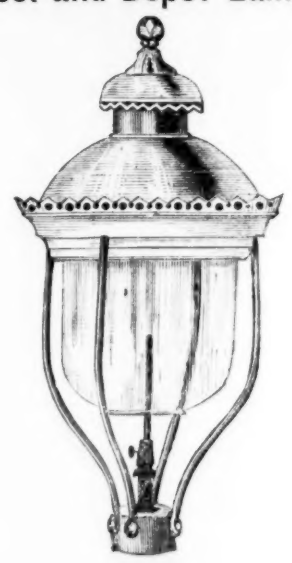

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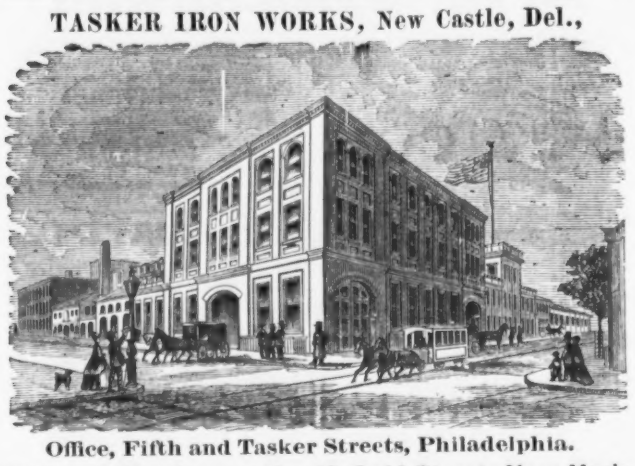

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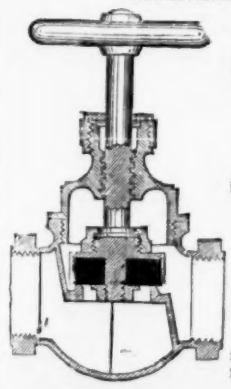

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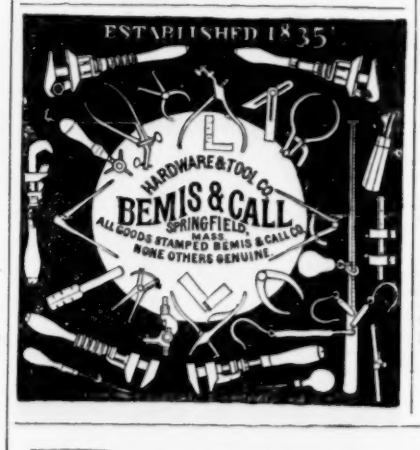

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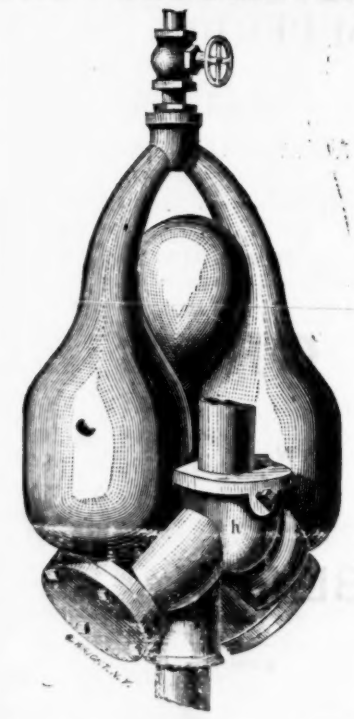

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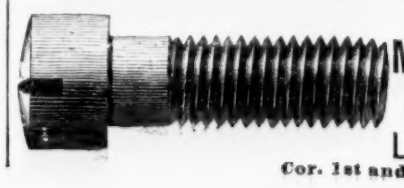

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One-sixteenth to five-eighths diameter. Heads and points to sample.

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The Iron Age Directory

and Index to Advertisements.

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, April 19, 1874.

If the iron trade of this city and State is not completely bankrupt, dead and buried beyond resurrection from the combined effects of the panic and inflation, it is not the fault of a local evening paper here, aided by sensational dispatches from Pottsville. During the week we were treated to a two column double leaded article, with sensation heads and profuse *scare marks*, upon the subject of this terrible depression in the iron trade, and hinting at some mysterious combination of manufacturers to "get even" with the puddlers. As usual, when the secular press writes about trade matters, facts, names and localities were all hopelessly jumbled and no little mischief done. We notice in this article just enough of fact to show that the information was furnished by some one in the trade, and the cause of the depression being stated at *over production and general demoralization of labor*, we recognize the ear marks at once of a favorite theory. But we were not prepared, considering the source, for such an allusion to Judge Lynch, as that "their rope is nearly now cut, and some fine morning the leaders of the Puddlers' Union will bring up so suddenly that no physician will be able to name their ailment!" The mingling of fact and fancy was miraculous. The late strike at the Crane Iron Co.'s Works, resulting in the blowing out of their furnaces, is attributed as "another evidence of the tyranny of the Puddlers' Union!" The connection between the puddler and the blast furnace being, of course, obvious. In order to make the statements doubly sure, a paragraph is quoted from a late article in your columns, which is credited to "*The Age*, one of the iron men's organs." The strangest portion of this sensational article is that it quotes from a late circular of the Eastern Iron Masters' Association, generally supposed to be a trade combination, whose circulars are not given to the press, at least to the iron trade press, and are supposed to be private matter. As before stated, just enough fact is given in this sensational communication to make it mischievous and to injure by implication many firms named. Coupled with the sensational telegrams from Pottsville, it is clearly evident that this was a feeble imitation of the ways of Wall street on a small scale, and its object to precipitate just the state of things quoted. Those best acquainted in the trade know just where to credit it, and the only pity is that usually well informed journalists should be thus imposed upon.

If this theory of over-production is hammered into furnacemen's ears much longer, we will have our mills and car shops idle by September, not because of dull times, but of an absolute famine of pig metal. Less iron has been made in 1874, thus far, than in any similar time since the war, and less is being made now, from this same fear, than the demands for actual consumption require. If any one doubts this, let him try to get 10,000 tons of choice gray forge for either consumptive or speculative purchase. It is not to be had among the furnaces of Eastern Pennsylvania, and it would be a good speculation at present quotations, as most capitalists know. The fact that our consuming industries have not been at work, as a rule, since September, and, hence, that the demand for pig iron has been light, does not prove that there is any too great productive capacity in the country, as is clearly shown by the prices of iron when these works were running—say, at this time last year. It is such false theories that mislead the manufacturer to his great injury.

The usual monthly meeting of the Franklin Institute, held last Thursday, was especially notable for several things. Among the most important of these was the report of the Committee on Exhibition, which has received subscriptions to the amount of $35,000 guaranteed for the Exhibition in October. The following circular explains the plan, and such success always attended the former industrial exhibitions of the Institute that this will doubtless be largely contributed to from all sections.

"The Franklin Institute will celebrate the fiftieth year of it foundation by an exhibition of arts and manufactures, to be held in the city of Philadelphia, from the 6th to the 31st of October, 1874.

"The exhibition will embrace all materials used in the arts, in every stage of manufacture, from their natural condition to the finished product, and all tools, implements and machines by which the gifts of nature are changed and adapted to the use, the comfort, or the enjoyment of mankind.

"The committee desire to make this exhibition represent as fully as possible the mechanical improvements of the last half century—to which the Institute has so largely contributed—and all artisans, mechanics, manufacturers and inventors throughout the United States are cordially invited to contribute their best productions, and compete for the prizes, which will be awarded to the most worthy.

"Every facility will be afforded for exhibiting machines in motion. All persons desiring to exhibit are requested to make early application for floor space or steam-power, or for room to exhibit boilers or engines in operation to drive the machinery of the exhibition. Foreign materials for manufactures, not entered for competition, will be welcomed and fairly exhibited. Communications are to be addressed to the Committee on Exhibitions, Franklin Institute, Philadelphia, Pa."

The transactions of the meeting were also highly interesting. A valuable paper on phosphor bronze was read by Mr. Hectro Orr, and several novelties exhibited by inventors. The secretary stated, as an evidence of the importance of the proposed geological survey of the State, that recent discoveries have proved that in the southern part of Pennsylvania a coal field with an area of 3000 square miles exists, containing superior veins of splint or block coal. The cycle of marine disasters, which has included so many ocean steamships, has extended to this locality. The *Nederland*, of the Red Star line, bound hither from Antwerp, came near being wrecked on Brigantine Shoals, but has gotten off with loss of cargo and rudder. The *Illinois*, while leaving her dock for Liverpool, collided with a tow of canal boats, sinking several, but sustained no damage and proceeded on her voyage.

To show that we are not all dead here in the way of trade, I quote the fact that during last month the Pennsylvania Railroad shipped 24,000 cars of freight from this city to yours, and that the amount of through freight is increasing week by week. The coal and coke tonnage of last week was 65,786 tons, and for the year to date 642,898 tons. These facts show the truth better than sensational articles. In a late number of your paper a correspondent from Tennessee found fault with an article in your columns stating the action of the Council of Foreign Bondholders, in London, which action animadverted very strongly upon defaulting American creditors among the Southern States. To show the good effect of such articles, rather than, as your correspondent claimed, their injury to these States, I clip the following from the cablegrams of Saturday last:

At a meeting in London yesterday, of Virginia bondholders, resolutions complimenting Governor Kemper on his recent financial message to the Legislature were adopted.

Now the facts are as follows: When that article appeared I sent it to a gentlemen in Virginia interested in the sale of certain iron lands on the London market. Surprised and grieved, he in turn sent it, with a strong letter, to a member of the Virginia House of Delegates, who, seeing the urgency of the case, laid it before the Governor as an additional argument for action. The Governor issued the message referred to, and the result abroad you have in the telegram above quoted, which shows, as Sam Patch said, that "some things may be done as well as others!"

The steamship *Ohio*, of the American line, arrived during the week with an unusually large cargo, in which the importation of metals is heavy, no less than 5105 boxes and 150 pigs tin being included. We also note, agreeably, the growing shipments of iron manufactures from this port, and the demand for American machinery abroad.

Pressed and Stamped Metal Goods.

Messrs. Sidney Shepard & Co. have been widely known throughout the country for over 30 years as wholesale hardware dealers, and during the past 20 years as proprietors of the Buffalo Stamping Works, and manufacturers of Japanned and ornamented ware. A writer on the Buffalo *Express*, describing a visit to this establishment, says: Within 10 years the range of goods manufactured by this firm has been largely extended, necessitating of course a corresponding extention of manufacturing space and mechanical facilities. The following is an enumeration of a few of the more prominent articles at present manufactured by Messrs. Shepard & Co.:

Dish pans, stew and sauce pans, preserving kettles, frying and baking pans, wash basins, water dippers, scolloped plates and dishes. The pans are produced of various sizes, and each article formed from one piece of heavy tinned iron. In Japanned ware the catalogue enumerates cash boxes and trunks in nests, cake and bread boxes, dust pans, spittoons, chamber pails; also, toilet ware, Japanned in colors, with ornamentation, stamped milk can bottoms, coal hods, coal vases and tea caddies, highly ornamented.

They also make a large variety of stamped goods, used by tinmen in making up tin wares, such as breasts and covers to teapots and tea kettles, pail and boiler covers, etc., a long list of which we find in their catalogue. The firm also manufacture the celebrated Brook's patent zinc and iron stove board, of which they sold 33,000 in 1873. Another large item of their manufacture is the patent Champion ice cream freezer, which they first introduced in 1873, have recently improved, and are making in thirteen different sizes, from a two quart to a forty quart. One of the most interesting branches of their manufacture is that of cans and caddies used by spice dealers, which they make in great variety of shapes and sizes. Upon entering the apartments where these are made we found them filled with power-presses, dies, shaping machines, formers, crimping machines, cutting shears, soldering fixtures, etc., operated by about fifty girls and boys, under the superintendence of a forcman who has charge of this department. They are able to produce six millions of cans per annum, and the demand for them comes from all parts of the country. They are the patentees and sole manufacturers of a dredge can, of which they sell two millions per annum. These are packed in cases containing 1000 each, and are used by all the principal spice manufacturers in the country.

The perforation of sheet iron and other metals, however, we deem of too much importance to pass unnoticed. Sheets of various sizes are perforated in tin or galvanized plate, also in black sheet iron.

THE MANUFACTORIES,

Mr. Shepard established in business in Buffalo in 1836, and commenced the manufacture of stamped tin ware a few years prior to 1850, in which year a wood structure was erected on the north side of Clinton street, near Union, since which the building has been enlarged from time to time to accommodate the growing business, until in 1870 its present dimensions had been reached, which are 83 by 125 feet and three stories in highth, and yet this building was found entirely too contracted. During the years 1871 and 1873 the large brick factory building, situated on the south side of Clinton street, and not far from the first works mentioned, was erected. The buildings here are four stories high, and cover ground about 100 by 150 feet. In the latter factory, beside a large amount of tin work, the Japanning, painting and ornamentation is done. The work is dried or baked in large

BRICK OVENS,

or rooms, of which there are three. The painting and ornamentation is nearly all the work of girls. It is in this building that the ice cream freezers are put together ready for market. Goods are also packed and stored here. Notwithstanding the modest front of the old factory, the mass and heaviest part of the work is done there. Machinery of the most improved patterns for cutting, stamping, pressing and spinning metal plate is here employed, both by hand and steam. One monster pressing machine requires fifteen horse-power to work it. In this the large dish pans, 7 inches in depth, are molded. All the dishes required to be made of heavy tin or iron are worked in the press in question. Another just like it, only smaller and of less caliber, stands beside it. The pieces molded in these presses are smoothed and completed in lathes, except so far as riveting on the ear pieces and handles, and the extra tinning process which they undergo at the last. Prior to our late war this kind of ware was imported from France, and was generally called

FRENCH PRESSED WARE.

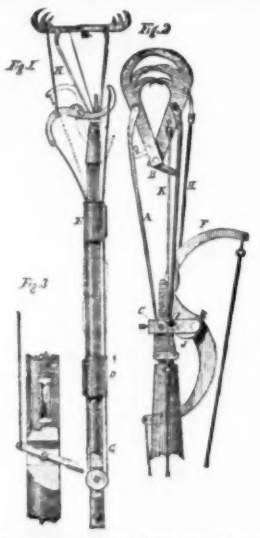
During the war, owing to the heavy cost of importing the goods, machinery was brought to this country, and the manufacture of French ware was thus inaugurated. The only establishments, we believe, that manufacture these goods at present, west of New York and Boston, are located at Buffalo, Chicago and St. Louis. They have introduced many improvements in the manufacture of tin ware, which utilize the waste tin, and produce the goods at a cost so low that no hand work, or even other establishments, are able to compete with them.

Incidently we learn that the value of machinery alone in one building was worth $50,000. The machinery is driven by a forty-five horse-power engine. Beside, in these manufactures altogether employment is given to 250 persons during a busy season, of which about 75 are girls. Of course, the goods are only sold by the manufacturers at wholesale, and the usual recourse is had in selling by traveling salesmen, though the establishment, being of such long standing and well known, has a large list of old and permanent customers. Their trade extends all over the country, from Boston and New York to California.

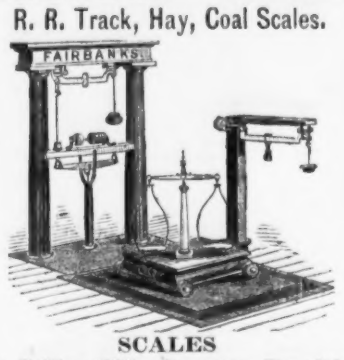
Recently an agency has been established in New York city with Geo. B. Walbridge, Esq.

A fair estimate of their manufacturing business may be stated at $500,000 per annum, and the capital employed in their manufacturing alone at $150,000 to $200,000. We would add that the firm also deal largely in house-keeping and tinmen's hardware. Their new illustrated catalogue embraces all the goods manufactured and sold by them. It is bound in cloth and contains 264 pages, and is a fair index of the variety and volume of the business.

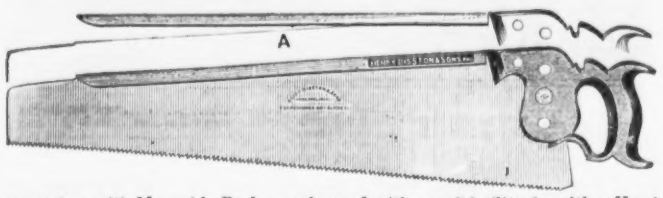
White Coal.—The London *Iron* says: Notwithstanding the antiquity of many proverbs dating back to pre-historic times, and their reception as figurative axioms day by day, they become exploded through deeper investigation or fuller knowledge. "As black as a coal," is not so venerable as some of this current coin of the intellect, but that, too, must go the way of many others. Our antipodes, that fragment of the most ancient of existent continents, that land of paradoxes, which would not allow the poor school boy his phrase of *Rara avis in terris, nigroque simillima cygno*, but must fain turn out a black swan, make animals with bird's beaks (*Ornithorhynchus paradoxus*), and put the stones outside of the fruit, has just revealed a new mineral—a white coal—which is fibrous, easily combustible and burns with a light flame and no smoke. Nor is the material rare; large districts are covered with it, and it lies on, or very near, the surface. The coal is a species of lignite, and the color is most likely due to the absence of bitumen. What a boon this coal would be near London, not only on the score of making our fogs less dense, but for the sake of our public buildings.



Attention is called to the above engraving of my improved
FISH GRAPPLING SPEAR,
Patented Oct. 28, 1873, No. 144,110.
Would be pleased to receive offers of purchase for a portion or whole interest in patent, or for any part or whole of U. S. or a portion on royalty. Offers respectfully solicited. For particulars, address the inventor.
J. W. Knapp, Cros River, Westchester Co., N. Y



Metallurgical.

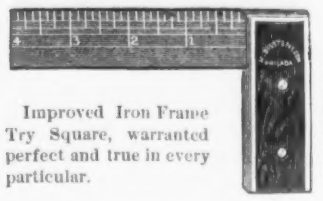


Hand Saw with Moveable Back—can be used with equal facility for either Hand or Back Saw.

Pork Packers' Saw.

Improved Pruning Saw and Knife, Patented August 29, 1873.

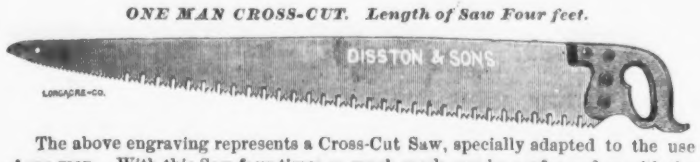
Table Saw.



Improved Iron Frame Try Square, warranted perfect and true in every particular.

Mitre Box Saw.

ONE MAN CROSS-CUT. Length of Saw Four feet.



The above engraving represents a Cross-Cut Saw, specially adapted to the use of one man. With this Saw four times as much work can be performed as with the ordinary Saw.

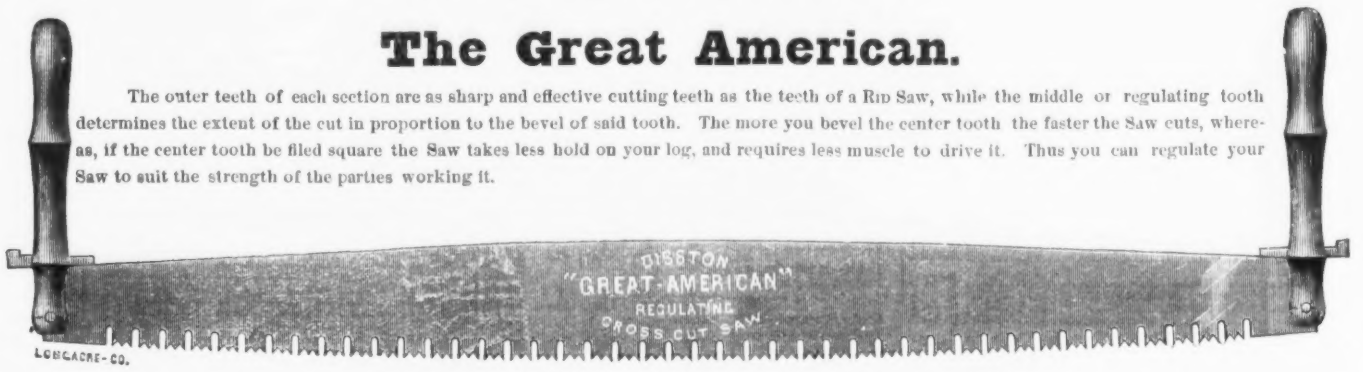
The Most Perfect Saw File ever offered to the Public.
"THE LITTLE WONDER."
Corrugated Saw File. Patented Sept. 2d and 16th, 1873.

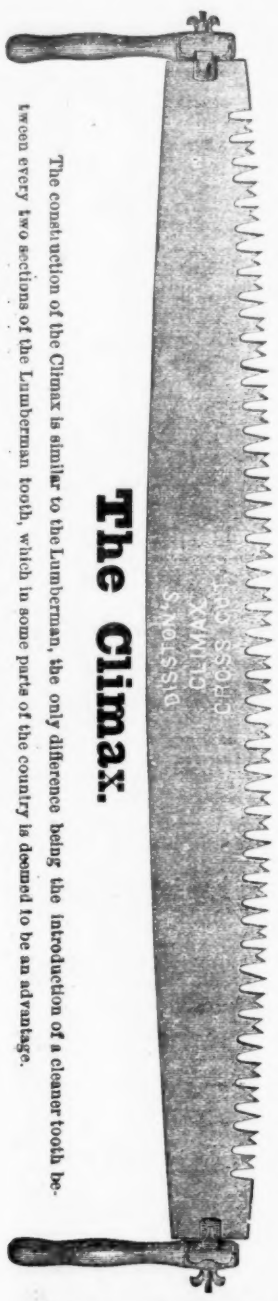
The gum tip for protecting the thumb and forefinger of the operator from abrasion, is much superior to the old style thumb stall or pad, and the peculiar shape of the handle gives the operator greater command over the file in its various manipulations.

Compass Saw, Keystone Tooth, it cuts with or across the grain with equal facility.

The Great American.

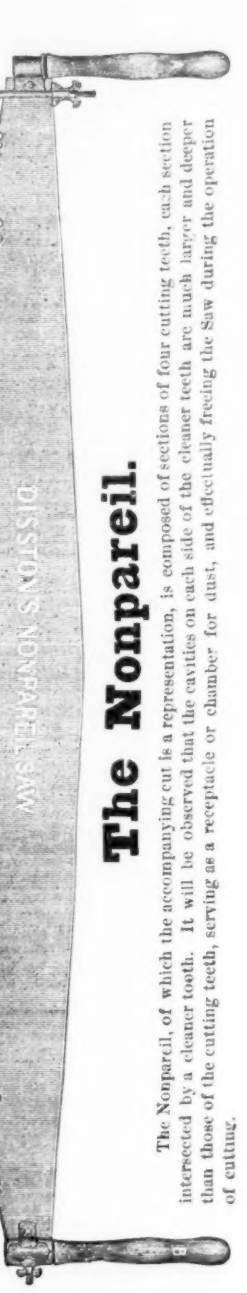
The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the center tooth the faster the Saw cuts, whereas, if the center tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.





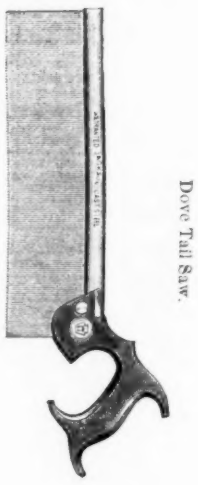
The Climax.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.



The Nonpareil.

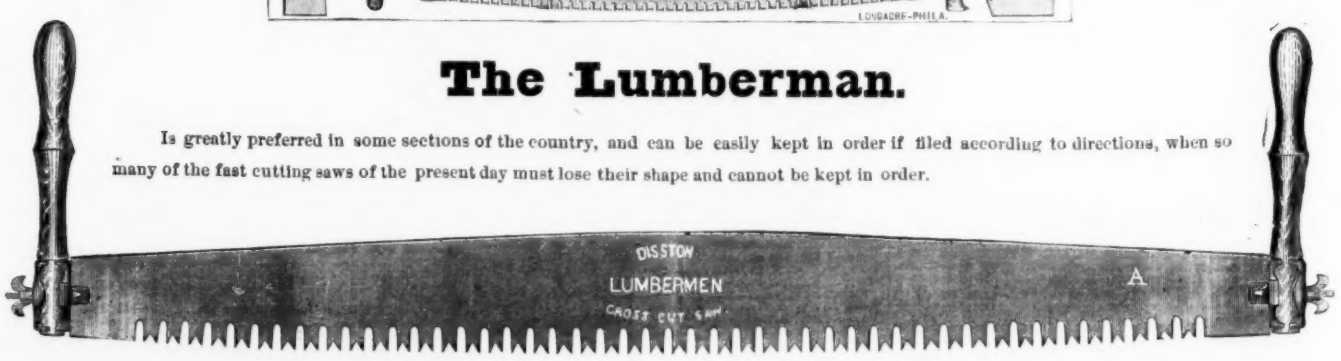
The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting.

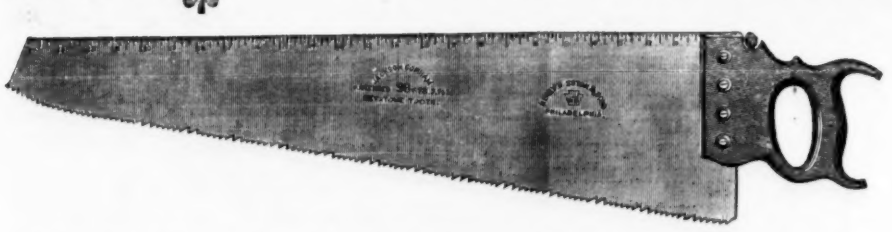


Dove Tail Saw.

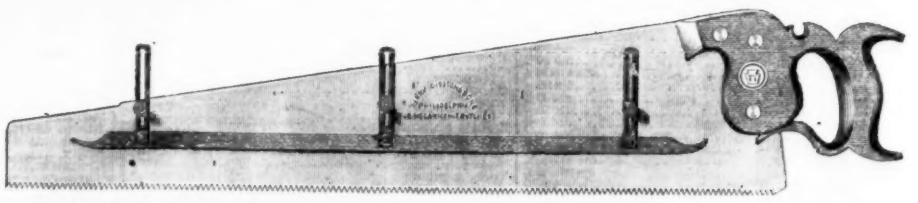
The Lumberman.

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast cutting saws of the present day must lose their shape and cannot be kept in order.

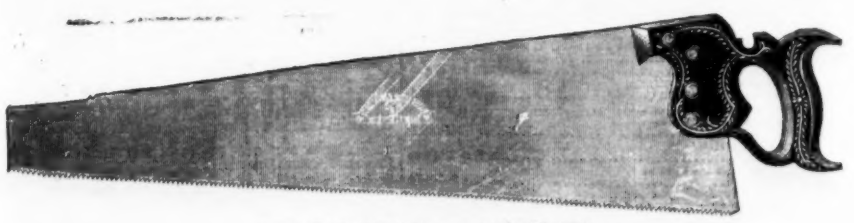




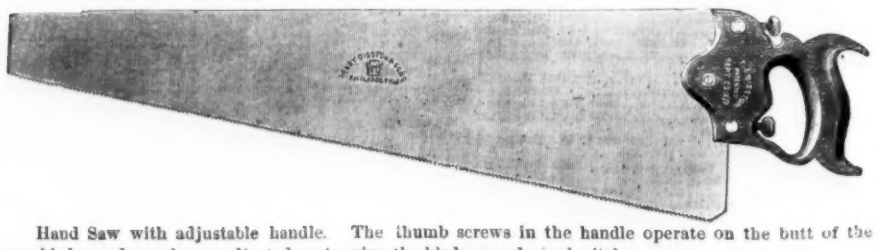
A cheap Saw, fully guaranteed. Six tools in one. Adapted to farmers' or plantation use. A Rip and Cross-Cut Saw, Square, Rule, Straight Edge and Scratch Awl combined.



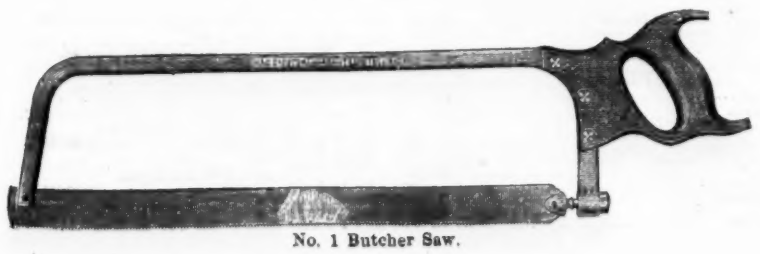
Patent Adjustable Gauge Saw for sawing tenons, kerfing, or any work where the cut is required to be of definite depth. Will pay for itself in one day. Try it and be convinced. Remove the gauge and use as an ordinary saw.



Game Cock Hand Saw—a perfect beauty.

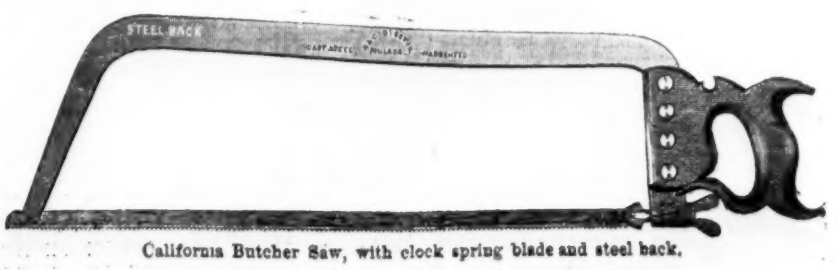


Hand Saw with adjustable handle. The thumb screws in the handle operate on the butt of the saw blade, and can be so adjusted as to give the blade any desired pitch.



No. 1 Butcher Saw.

Hack Saw. The blade in this saw is reversible, an advantage which will be readily appreciated by mechanics.



California Butcher Saw, with clock spring blade and steel back.

New York Wholesale Prices, April 22, 1874.

HARDWARE.

Anvils.
Solid Cast Steel ... ℘ ℔ 14c
Wright's ... ℘ ℔ gold 12c; over 250 ℔s 12½c, gold
Armitage's Mouse Hole ... gold 11c
Wilkinson's ... ℘ ℔ gold 11½c
Eagle Anvils, ℘ ℔ 11c currency ... dis 15 @ 15&5 %

Apple Parers.
Turn Table, Lightning, Conqueror ... $8·50 ℘ doz
Reading ... ℘ doz 8 00
Union ... ℘ doz 9 00
Bay State, Paring, Coring and Slicing ... 15 00 } dis 5 %
Skeleton " " " ... 9 00
Climax Slicer ... 9 00
Bay State Peach Parer ... $11 00 @ 11 50
Lightning " " ... 11 00 @ 11 50
Peach Stoner and Halver ... 7 00

Augers and Bits.
Snell Mfg. Co ... dis 15 @ 20 %
Russell Jennings ... dis 10 %
Douglass Mfg. Co., Extra ...
" " No. 1 ...
" " Hollow Augers ...
Cushman's Expanding Hollow Augers ... dis 20 %
Ives' Augers and Bits ... dis 30&10 %
" Gouge Lip Augers and Bits ... dis 30&10 %
" Hollow Augers ... dis 30&10 %
" Expansive Hollow Augers ... dis 30&10 %
" Expansive Bits ... dis 20&10 %
Andrews' Bits ... dis 25 %
Clark's Expansive Bits ... dis 15 %
Cook's Patent Augers ... dis 50 %
" " Bits ... dis 40 %
Shepardson's Double Cut Bits ... dis 20 %
Griswold's Patent ... dis 20 %
Cast Steel Cut Augers ... dis 30&10 %
" Auger Bits ... dis 30&10 %
Gimlet Bits ... dis 10&10 %
Long Augers ... new list dis 30 %
Bonney's Patent Hollow ... $48 per doz—dis 25 %
Stearns' " " ... $48 per doz—dis 25 %
Morse's Bit Stock Drills ... dis 20 %
Nobles Mfg. Co. C. S. Cut Augers ... dis 30&10 %
Watrous Ship Augers ... dis 10 %
Vaughan's Post Hole—6 in. $23 00; 9 in. $25 per doz ... dis 20 %

Axes.
Blood's ... $12 50 @ 14 00
Hunt's ... ℘ doz $15 00 @ 17 50 net @ dis 5 %
Collins' ... ℘ doz 11 00 @ 15 50 net @ dis 5 %
Hurd's ... ℘ doz 12 50 @ 13 50
Schweitzer Mfg. Co.'s ... ℘ doz 13 00 @ 15 00
Simmons' ... ℘ doz 12 50 @ 14 00
Morris' ... ℘ doz 12 50 @ 13 50
Red Jacket ... ℘ doz 12 00 @ 12 50
Mann's ... ℘ doz 12 50 @ 13 00
Double Bitted ... ℘ doz 21 50 @ 22 00
Fowell Tool Co., "Peerless" ... ℘ doz 13 00 @ 14 50
Underhill's ... ℘ doz 12 50 @ 13 50
" Crown ... ℘ doz 13 00 @ 14 00
John Leverett's ... ℘ doz 12 50 @ 15 50
Nobles Mfg. Co. S. B. ... ℘ doz 12 50 @ 18 00
" D. B. ... ℘ doz 22 00 @ 23 00

Balances.
Chatillon's, Frary's, Morton's ... new list dis 15 %

Bands.
Plated ... new list dis 50&5 %
Iron Rim ... new list dis 15&5 %
Brass (Plated list) ... new list dis 50, 10&5 %
Oroide ... new list dis 50&5 %

Bells.
Hand, Light Brass ... dis 60&10 @ 65&10 %
White Metal ... dis 50&10 %
Swiss ... dis 50 %
Globe ... dis 15&10 %
Abbe's ... dis 10&10 %
Taylor's Patent Door ... net
Western Gong ... net
Brook's Crank ... dis 10 %
" Pull ... dis 15&10 %
Hart Mfg. Co., Crank and Pull ... dis 50&10 %
Cow—Common Wrought ... dis 20&10 %
Western ... new list dis 20&10 %
Kentucky "Star" ... new list dis 20&10 %
Dodge's Genuine Kentucky ... new list dis 25 %
Yaw's Genuine ... dis 20 %
Texas ... dis 20&10 %
Call ... dis 15 %

Bellows.
Blacksmiths' ... dis 15 %
Moulders' ... dis 15 %
Hand Bellows ... dis 10 %

Blind Fasteners.
Van Sand's ... ℘ gross $14 00
Washburn's Patent ... ℘ gross 14 00
Merriman's ...

Blind Staples.
Boardman's Patent, ½ in. and larger ... ℘ ℔ 37 c
" ⅜ in ... " 42 c

Bolts.
Carriage and Tire, Ætna Nut Co ... dis 60 %
Stove, Ætna Nut Co ... dis 10&5 %
Cast Iron Barrel, Shutter, &c ... new list dis 60&10 %
Wrought Iron Barrel ... new list dis 50&10 %
" " Square ... new list dis 50&10 %
Wrought Iron Flush ... dis 15 %
Carriage and Tire, Common ... dis 70&10&5 %
" " " Norway Iron ... 50&10 %
Star, Philadelphia ... dis 50 @ 50&10 %
Eagle, Philadelphia ... dis 50 @ 50&10 %
Philadelphia Pattern, P. S. & W ... dis 50&10 %
Tire, Bessemer Steel, Hubbard & Curtiss ... dis 50 %
Carriage and Tire, R. B. & W ... old list dis 50&5 %
Plow, R. B. & W ... dis 30 %
Stove, R. B. & W ... dis 10 %
" Shelton Co, Shaved Heads ... dis 15 %
Union Nut Co., old list ... dis 50&2½ %
" " Stove ... dis 15 %
Machine ... dis 30&10 @ 40 %

Borax.—In cases of 100 ℔s ... ℘ ℔ 18c

Boring Machines.
Kellogg's ... dis 15 %
Snell Mfg. Co., Rice's Patent ... dis 15 %
" " Regular ... dis 15 %
Douglas Mfg. Co ... dis 20 %
Morticing Machines each ... $18 00

Bow Pins ... dis 50 %

Braces.
Barber's Patent ... dis 40&5 %
Wilson Mfg. Co ... new list dis 10 %
Spofford's Patent ... dis 40&5 %
Noble's Patent ... dis 40&5 %
Bartholomew's American Ball ... dis 10&10 %
" Patent Grip ... dis 40 %
Ives' Novelty ... dis 40&5 %

Bull Rings ... dis 50 %

Bung Hole Borers.
Common and Ring ... dis 25 %
Enterprise Mfg. Co ... dis 20&10 %
Ives' Tap Borers ... dis 25 %

Butchers' Cleavers.
Bradley's ... dis 25 %
Beatty's ... new list dis 10 %

2	3	4	5	6	7	8	9
$19·00	$21·50	$24·00	$27·00	$30·00	$33·50	$36·50	$40·00

Hart Mfg. Co ... dis 45&10 %

0	1	2	3	4	5	6
$25·25	$29·75	$33·25	$38·75	$43·55	$48·50	$54·00

Butts.
Wrought Brass ... new list dis 30 %
Cast Fast Joint, Narrow ... dis 50 %
" " Broad ... dis 50 %
Cast Loose Joint ... dis 60 %
" " Mayer ... dis 50 %
" " Parliament ... dis 50 %
Loose Pin ... dis 40&10 %
Wrought Fast Joint, Narrow ... dis 30 %
Wrought Broad ... dis 35 %
" Loose Joint ... dis 35 %
Wrought Table and Back Flaps ... dis 30 %
Palmer Blind Butts ... dis 30&10 %
Nicholson Blind Butts ... dis 40&10 %
Parker's Blind Butts ... dis 45&10 %
Huffer's Blind Butts ... dis 30&10 %
A. S. Parker's ... dis 40&10 %
Clark's Surface Blind Hinges, Nos. 1, 3 and 5 ... dis 50 %
" " " No. 20 ... dis 55&10 %
" Mortise " ... dis 30&5 %
Seymour's ... dis 40&10 %
Shepard's ... dis 50 %
Garretson's ... No. 1, dis 5&10 %; Nos. 2 and 7, dis 50 %
The American Spiral Spring Butt Co ... dis 20 %
Standard ... dis 50 %

Caps—Percussion, per 1000.
G. D ... 40c
Ely's E. B ... 1-4s, 58c.; 1-10s, 65c., gold
" Double Waterproof, 1-4s, $1·45; 1-10s, $1·52½c., gold
Colt's ... 1-10s 70c., gold

Cartridges.
Metallic ... dis 50 @ 50&10 %

Cards.—Horse and Curry ... dis 25&10 %
Cotton ... new list dis 10&10 %
Wool ... new list dis 10&10 %

Carpet Stretchers.
P. S. & W ... per doz $2 00; dis 33⅓ %

Casters.
Iron and Wood Wheel, Bed ... dis 33⅓&10 %
Brass and Porcelain Wheel, Bed ... dis 33⅓&10 %
Deep Socket, Bed ... new list dis 20&10 %
Iron and Wood Wheel Plate ... new list dis 33⅓&10 %
Brass Wheel Plate ... new list dis 33⅓&10 %
Porcelain Wheel Plate ... new list dis 33⅓&10 %

Cattle Leaders ... dis 50&10 %

Chain.
English Coil, by the cask ... net gold

℘ ℔	13	9½	9	8½	8¼	8c
	3-16	¼	5-16	⅜	7-16	½

Trace, 6½-10-2 ... by the cask, ℘ pair, gold, 60c
Trace, 7-10-2 ... by the cask, ℘ pair, gold, 65c
Galvanized Pump Chain ... ℘ ℔ 18c
German Halter Chain ... new list, Jan. 1, dis 10 %
German Coil ... new list, Jan. 1, dis 10 %
Sash Chain, Iron ... dis 50 %
" Brass ... dis 40 %

Chalk.
White ... ℘ gross, 50c
Red ... ℘ gross, 75c
Blue ... ℘ gross, 90c
Crayons ... ℘ gross, 14c

Cherry Stoners.
"Family" ... ℘ doz $9·00

Chisels.
Socket Firmers ... dis 60 @ 60&10 %
Socket Framing ... dis 60 @ 60&10 %
Socket Corner ... dis 60 %
Tanged Firmers ... dis 40 to 40&10 %
Butcher's ... $5·50 to £ gold—new list
Newbould's ... $5·50 to £ gold
Spear & Jackson's ... $5·50 to £ gold—new list

Clips, Axle.
Norway or Best ... dis 30 %
Superior ... dis 50 %
"Star," Superior Philadelphia ... dis 45&5 %

Coal Shovels.
Iron Handled ... ℘ doz, $ 85 @ 1 25
Wooden Handled ... ℘ doz, 1 00 @ 2 00

Coal Hods.—Smith, Burns & Co ... dis 35 %

No.	14	15	16	17	18	
Japanned	$9·00	9·75	10·50	12·00	13·50	per doz
Galvanized	13·00	14·50	15·50	17·50	19·50	"

Morning Glory ... dis 30 %

No.	15	16	17	
Japanned	$12·50	13·50	15·50	per doz
Galvanized	18·00	19·50	21·00	"

Cockeyes ... dis 30 %

Cocks.
Brass Racking ... dis 25&10 %
Lock and Globe ... dis 25&10 %

Coffee Mills.
Board and Box ... dis 15 %
Increase Wilson's ... new list dis 15 %
Selsor's Pat ... $9·50, $10·50—dis 25 %
French Steel ... dis 15 %
The Swift ... dis 25 %
"American" ... dis 20 %
Enterprise Mfg. Co ... dis 20&10 %

Compasses and Dividers.
Bemis ... dis 35 %
Excelsior ... dis 30 %
Peck Stow & Wilcox ... dis 25 %

Coopers' Tools.
Bradley's ... dis 15 @ 20 %
Chas. E. Little ... dis 15 @ 20 %
Swan & Brombacher ... dis 15 @ 20 %

Corn Knives and Cutters.
Bradley's ... dis 10 %

Crow Bars.
Cast Steel ... ℘ ℔ 11c. net
Iron, steel points ... ℘ ℔ 7c

Crucibles.
Gautier & Co ... ℘ No. 5½c

Curry Combs.
Hotchkiss' and Kellogg's, Iron and Brass ... dis 15 %
Fitch's ... dis 15&10 %
Rubber ... ℘ doz, $9·00—dis 15 %
Schweitzer Mfg. Co ... dis 20 %

Curtain Pins.
Silvered Glass ... old list dis 45&10 %

Cutlery.
American Table ... net list
American Pocket ... dis 25 %

Dog Collars.
Embossed Gilt ... dis 10 %
Leather ... dis 20 %

Door Springs.
Gray's ... $7·50 per doz—dis 40&10 %
Torrey's Patent ... $7·50 ℘ doz—dis 40&10 %
Palmer's Japanned No. 6 ... ℘ doz $5·00
" Coppered " ... " 6·00
" Silvered " ... " 8·00
Challenge.—
Japanned ... ℘ doz $4 00 @ 6 00
Bronzed ... ℘ doz 5 00 @ 7 00
Nickel Plated ... ℘ doz 6 50 @ 9 00
1 Gross lots ... dis 10 %
5 Gross lots ... dis 20 %

Drawing Knives ... dis 60 @ 60&10 %
Bradley's ... dis 25 %
Adjustable Handled ... dis 10 %

Drills.
Ingersoll's Ratchet ... dis 25 %
Moore's Triple Acting Ratchet ... dis 20 %
Whitney's Ratchet ... dis 20 %
Blacksmiths' ... each $3 25 net

Drug Mills.
American Drug Mills ... dis 20 %

Egg Beaters.
Monroe's ... ℘ doz net $8·25 @ 8·50
Dover ... ℘ doz net $6·00
National ... ℘ doz $4·50—dis 10 %
Peerless ... ℘ doz net $4·00

Emery.
Genuine Chester—Regular Nos ... ℘ ℔ 7c } dis 5 @ 10 %
" Flour and FF ... ℘ ℔ 4c }
Washington Mills—Regular Nos ... ℘ ℔ 8c
" Flour ... ℘ ℔ 5c

Enameled and Tinned Ware.
Kettles ... dis 20 @ 25 %
Sauce Pans, Glue Pots, &c ... dis 15 %

Escutcheons.
Brass Thread ... dis 60&10 %

Faucets.
Cork Lined, Wood ... dis 60 %
Fenn's ... dis 50 %
" Cork Stops ... dis 40 %
Star ... dis 55&10 %
Frary's Patent Petroleum ... dis 10&10 %
Taylor's Pattern " ... dis 20&10 %
Wood and Metallic ... dis 40 %

Felloe Plates ... ℘ ℔ 14c; dis 10 %

Files.
Nicholson ... $5 00 to £ currency—dis 10 %
Newbould's ... 5 25 to £ gold
J. & Riley Carr's ... 5 50 to £ gold
" " Rasps ... 5 75 to £ gold
Stubs' ... 8 50 @ 9 00 to £ gold
Butcher's ... 5 50 to £ gold
Walter Spencer & Co.'s "Diamond" ... 5 25 to £ gold
Spear & Jackson's ... 5 50 to £ gold
Hargreaves, Smith & Co.'s ... 5 00 to £ gold
Jowitt's ... 5 25 to £ gold
"Western" ... 5 00 to £ net
W. K. & C. Peace's "Imperial" ... 5 25 to £ gold
R. Ibbotson ... 5 00 to £ gold
Beam & Mursey, "Cyclops" ... 4 85 to £ gold
Fisher's ... 4 75 to £ gold
Goodlad's ... 4 00 to £ gold
Moss & Gamble ... 5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.) 5 00 to £ gold
" Horse Rasps ... 5 50 to £ gold

Floral Tools ... dis 25 %

Fluting Machines.
Acme ... $7 00 each net
Manville, No. 2 ... 7 00 each net
Knox, with 4-inch Rolls ... 5 00 each net
" " 6 " ... 6 00 each net
O. K ... 6 50 each net
Peerless, 4-inch Rolls ... 4 00 each net
" 5 " ... 5 00 each net
Excelsior, No. 1 ... 4 75 each net
" No. 2 ... 6 50 each net
Diamond ... 7 50 each net
Climax 7-inch Rolls ... 8 00 each net
" 4½ " ... 6 50 each net
Empire ... 4 00 each net
Eureka, No. 1, 7-inch Roll ... 8 00 each net
" No. 2, 5-inch Roll ... 6 00 each net
K. F. M., 4½-inch Roll ... 5 50 each net
" 6-inch Roll ... 6 00 each net
Myers' Fashion Fluter, 4½-inch Rolls ... 3 00 each net
" Convex Brass Fluter, Sad Iron attachment ... $1·75
Domestic Fluter ... $1·75 each net
Fairy, Self-Heater ... 8 00 each net
Geneva Hand Fluter ... $15 00 per doz net
Champion, 6 inch rolls ... $6 00 each net
" 4 inch rolls ... $5 00 each net
Mrs. Coles, 7 inch rolls ... 6 50
" " 5 " ... 5 50

Forks.
Hay, Manure & Spading ... dis 25 %
Plated A 1 ... dis 30&5 %

Freezers.
Torrey's ... dis 50 %

Fry Pans.—P. S. & W.
Tinned ... dis 25 %

℘ doz	$3·00	3·25	3·62	4·00	4·50	5·00	5·50	6·00	7·50
No.	0	1	2	3	4	5	6	7	8

Smith, Burns & Co., "Excelsior" Polished ... dis 35 %

℘ doz	$3·70	4·00	4·70	5·30	6·00	7·00	8·00	9·00
No.	1	2	3	4	5	6	7	8

Gauges.
Marking ... dis 45&10 %
Wire ... dis 10 %

Hammers.
Emmet Hammer Co ... dis 10 %
Maydole's ... dis 5 %
Cheney's ... new list net
Verree ... dis 5 %
Yerks & Plumb ... new advanced list dis 5 @ 10 %
Minot & Co ... dis 15 %
Magnetic Tack ... dis 20&10 %

Handles.
Hammer and Hatchet ... dis 10 %
Quakertown, Axe, Pick and Sledge ... dis 10 %
" Hammer and Hatchet ... net
Greensboro', Axe, Pick, Hammer, &c ... dis 10 %
Woolworth Axe, Pick and Sledge ... dis 10 %
Brad Awl ... per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td ... 5 25—dis 10&10 %
" " " large ... 6 25—dis 10&10 %
Apple " " ass'td ... 6 00—dis 10&10 %
" " " large ... 7 00—dis 10&10 %
Socket " " ass'td ... 3 50—dis 10&10 %
" Framing ... 6 00—dis 10&10 %
File ... 3 50—dis 10&10 %
Auger ... 5 50—dis 10&10 %
" large ... 6 50—dis 10&10 %

Hangers.
Barn Door ... revised list dis 60&10 %
"Anti-Friction" (Rider, Wooster & Co.) ... dis 50 %
Novelty ... dis 30 %

Harness Snaps.
Henshaw's ... dis 25&10 %
Judd's ... dis 40 %
Fitch's ... dis 30 %
Hotchkiss' ... dis 10 %
Andrews' ... dis 25 %
Sargent's ... new list dis 50&10 %

Hatchets.—Isaiah Blood ... dis 10 %

	Nos.				
Shingling,	Nos. 1 2 3	℘ doz	$7 50	8 00	8 50
Claw,	" 1 2 3	℘ doz	8 50	9 00	9 50
Lathing,	" 1 2 3	℘ doz	7 50	8 00	8 50

Hunt's ... dis 10 %

Shingling,	Nos. 1 2 3	℘ doz	$7 25	8 00	8 75
Claw,	" 1 2 3	℘ doz	7 75	8 50	9 25
Lathing,	" 1 2 3	℘ doz	7 50	8 25	9 00

Hurd's ... dis 30 %

Shingling,	Nos. 1 2 3	℘ doz	$8 00	8 50	9 00
Claw,	" 1 2 3	℘ doz	9 00	9 50	10 00
Lathing,	" 1 2 3	℘ doz	8 00	8 50	9 00

Newark's Edge Tool Co.'s ... dis 25 %

Shingling,	Nos. 1 2 3	℘ doz	$6 50	7 00	7 50
Claw,	" 1 2 3	℘ doz	7 25	7 75	8 25
Lathing,	" 1 2 3	℘ doz	6 50	7 00	7 50

Yerks & Plumb ... dis 10 %

Shingling,	Nos. 1 2 3	℘ doz	$7 00	7 50	8 00
Claw,	" 1 2 3	℘ doz	7 50	8 00	8 50
Lathing,	" 1 2 3	℘ doz	7 00	7 50	8 00

Simmon's ... dis 15 %

Shingling,	Nos. 0 1 2 3	℘ doz	$7 50	8 00	8 50	9 00
Claw,	" 1 2 3	℘ doz		9 00	9 50	10 00
Lathing,	" 1 2 3	℘ doz		8 00	8 50	9 00
Broad,	" 1 2 3	℘ doz		9 00	10 00	12 00
"	" 4 5 6	℘ doz		14 00	16 00	18 00
"	" 7 8	℘ doz		20 00	22 00	

Elephant ... dis 25 %

Shingling,	Nos. 1 2 3	℘ doz	$8 00	8 50	9 00
Claw,	" 1 2 3	℘ doz	9 00	9 50	10 00
Lathing,	" 1 2 3	℘ doz	8 00	8 50	9 00

J. P. Verree & Co ... dis 5 %

Shingling,	Nos. 1 2 3	℘ doz	$7 00	7 50	8 00
Claw,	" 1 2 3	℘ doz	7 50	8 00	8 50
Lathing,	" 1 2 3	℘ doz	7 00	7 50	8 00

Underhill's ... dis 10 %

Shingling,	Nos. 1 2 3	℘ doz	7 25	8 00	8 75
Claw,	" 1 2 3	℘ doz	7 75	8 50	9 25
Lathing,	" 1 2	℘ doz	11 00	12 00	

Hinges.
Wrought Strap and T ... dis 25&7½ %
Providence Plate. { 6 and 8 in. list 11c. / over 8 in. list 9½c. } ... dis 20 %
Screw Hook and Strap { 8, 10, 12 in. 8c / 14 to 36 in. 6½c } ... net
Heavy Welded Hook { 8 to 12 in., 9c / 14 in. & up, 8½c } dis 10 %
Screw Hook and Eye { ⅝ to 1 in., 9½c / ½ in. 10½c / ⅜ in. 12½c } ... net

Hoes.
Solid Shank, C. S ... ℘ doz $8 00—dis 20 @ 30 %
Socket ... ℘ doz 9 00—dis 20 @ 30 %
Riveted Eye ... ℘ doz 5 00—dis 20 @ 30 %
Grub ... dis 20 %
Planters'—Winsted ... add 10 %
Scovill ... add 33⅓ %
Scovill Pattern (Winsted) ... add 20 %

Hooks.
Belt ... dis 50 %
Clothes Line ... dis 60&10 %
Bench—Skinner's ... per doz $8 00, dis 30 %
Bench—Hotchkiss' $5 00 ℘ doz ... dis 10 %
Bench—Weston's No. 1, $8·50; No. 2, $7·00 per doz net
" —McGill's ... $8 00 per doz, dis 10 %
Wardrobe, Japanned ... new list dis 60&10 %
Hat and Coat " ... new list dis 60&10 %
Wrought Staples and Hooks and Staples ... dis 60, 10&10 %
Screw Hooks and Eyes, revised list ... dis 70 %
Grass ... dis 20 %
Whiffletree—Patent ... dis 30 %
Hooks and Eyes—Malleable Iron ... dis 50 %
" " Brass ... dis 50&10 %

Horse Nails.
Putnam's.

No.	5	6	7	8	9	10
	32c	29c	26c	25c	24c	23c

In lots 2000 lbs. dis. 5 %.
Ausable

No.	5	6	7	8	9	10
	30c	27c	25c	24c	23c	22c
Pointed & finished	31c	28c	26c	25c	24c	23c
Clinton	22c	19c	17c	16c	15c	14c

In lots of 1000 lbs. 5 % discount.
Brundage.

No.	5	6	7	8	9	10
	29c	26c	24c	23c	22c	21c

In lots of 500 lbs., dis. 5 %.
American Pressed.

No.	5	6	7	8	9	10
	22c	20c	20c	20c	20c	20c

In lots of 1000 lbs. dis 5 %.
Perkins Finished (ready to drive).

No.	5	6	7	8	9	10
	31c	28c	26c	25c	24c	23c

In lots of 1000 lbs. dis 5 %.
Buffalo Forged.

No.	6	7	8	9	10
	28c	26c	25c	24c	23c

Globe (Pointed and Polished).

No.	5	6	7	8	9	10
	31c	28c	26c	25c	24c	23c

In lots of 1000 lbs., 5 % discount.
National (Pointed and Polished).

No.	5	6	7	8	9	10
Patent Finish	28	25	23	22	21	20
Extra "	30	27	25	24	23	22

In lots of 1000 lbs., dis 5 %.
Vulcan (Blued, pointed, ready to drive).

No.	5	6	7	8	9	10
	33c	30c	28c	27c	26c	25c

In lots of 500 lbs., 5 % discount.
" 1000 lbs 7½ % discount.
New London Horse Nails.

No.	6	7	8	9	10
Great Western	27c	25c	24c	23c	22c
U B	29c	27c	26c	25c	24c

In lots of 1000 lbs., dis 5 %.
Star Brand ... ℘ ℔ 16c
Morgan ... 14c

Horse Shoes.
Burden ... ℘ keg, $5 87½
R. I. Horse Shoe Co., Perkins Pattern ... ℘ keg, 5 87½
" " R. I. Pattern ... ℘ keg, 6 37½
Mule Shoes ... ℘ keg, 6 87½

Kettles.
Brass ... ℘ ℔ 55c net
In lots of 500 ℔s ... ℘ ℔ 50c net

Knives.
Ames' Butcher Knives ... dis 20 %
" Shoe " ... dis 15 %
Hay and Straw, "Wadsworth's" ... dis 20 %

Knobs.
Base—Common ... net
" Plush Tip ... dis 10 %
" Elastic End ... reduced list dis 10&10 %

Ladles.
Melting ... dis 20 %

Lanterns.
Brady's Patent ... dis 10 %
Ætna ... dis 10 %
Yankee ... dis 10 %
De Beque ... dis 10 %

Locks and Latches.
Cabinet—Eagle ... dis 25 %
Cabinet—Gaylord ... dis 25 %
Trunk ... dis 10 %
Continental ... dis 15 %
Shepardson's ... dis 20 %
American Lock Co ... dis 33⅓ %
Plate ... dis 25 %
Pad ... new list dis 50, and 2 % for cash
Barnes & Deitz ... dis 25 %
Yale Lock Co ... dis 40 %
Sargent & Greenleaf ... dis 20 %
Trenton Lock Co., Branford, Norwich, Russell & Erwin, Norwalk, Nashua, Mallory, Wheeler & Co., P. & F. Corbin, Parker & Whipple, Jacobus & Nimick Mfg. Co ... New list dis 45 %. 2 % extra for cash.

Mallets.
Hickory and Lignumvitæ ... dis 10&10 %

Meat Cutters.
Dixon's (P. S. & W.) ... dis 10 %

No.	1	2	3	4
℘ doz	$14 00	$17 00	$19 00	$30 00

Hales' ... dis 25 %

No.	11	12	13
℘ doz	$27 00	$33 00	$42 00

Miles Challenge ... dis 20 %

No.	1	2	3
℘ doz	$22·00	$30·00	$40·00

Perry's Champion (P. S. & W.) ... dis 10 %

No.	200	300	400
℘ doz	$22 00	$27 00	$40 00

Woodruff's (P. S. & W.) ... dis 10 %

No.	100	150
℘ doz	$15 00	$18 00

American ... dis 25 @ 25&5 %

No.	1	2	2½	3	4	5
Each	$6 00	$9 00	$14 00	$15 00	$30 00	$75 00

Molasses Gates.
Stebbins' Pattern ... dis 60&10 %
Tinned ends ... dis 40&10 %
Patent Self-Measuring ... per doz $42 00—dis 20&10 %
Bush's ... dis 20 %
Lincoln's ... dis 50&10 %

Mortars and Pestles.
Iron ... net

Mouse Traps.
Wood Choker ... ℘ doz holes, 16 @ 18c
Round, Wire ... ℘ doz $1 50 to 2 00 net
Square, " ... ℘ doz 2 00 to 2 50 net
Cage, " ... ℘ doz 2 50, dis 10 %

Nails.—See Trade Report.

Nuts and Washers.
Nuts ... large, 5½c; small, 7½c off list.
Washers ... large, 7c; small, 9½c off list.

Oil Stones.
Washita No. 1 ... ℘ ℔ 22c
" Slips ... ℘ ℔ 45c
Washita No. 2 ... ℘ ℔ 17c
Arkansas ... 1 25
Hindostan ... ℘ ℔ 6c dis 10&10 %
" Slips ... ℘ ℔ 10c dis 10&10 %

Oilers.
Olmsted's ... new list dis 25&10 %
Broughton's ... dis 25&5 %
Malleable ... per doz $5 00 dis 10 %
Common Tin ... dis 30 %
" Zinc ... dis 30 %
" Brass and Copper ... dis 30 %

Picks.

		Nos. 1	2	3	4	5
Washoe R. R ... dis 25 % ... ℘ doz		$14·00	15·00	16·00	17·00	18·00
Washoe Coal, dis 20 %		$8·50	9·00	10·00	11·00	13·00	15·00

Extra 10 % dis 25 doz in 6 months, ending Jan. and July.

Picture Nails and Knobs.
Richards' Patent ... dis 40 @ 40&10 %

Pinking Irons ... per doz $3 00—dis 60&10 %

Planes.
Chapin's, 1st quality ... dis 30 %
Sandusky Tool Co., 1st quality ... dis 30 %
" " 2d " (Ogontz) ... dis 40 %
Ohio Tool Co., 1st quality ... dis 30 %
" " 2d quality (Sciota) ... dis 40 %
Owasco Tool Co., 1st quality ... dis 30 %
" " 2d quality ... dis 40 %
Howland's, 1st quality ... dis 30 %
Bailey's Patent Adjustable ... dis 20&10 %
Plane Irons, Butcher's ... $5 50 to £ gold—new list
" Chapin's ... dis 10&10 %
" Ohio Tool Co ... dis 10 %
" Spear & Jackson's ... 5 50 to £ gold—new list
" Sandusky Tool Co ... dis 10 %

Pliers.
Button's Patent ... dis 33⅓ %

Plumbs and Levels.
Chapin's ... dis 60&10 %
Standard Rule Co.'s New Adjustable ... dis 50&10 %
Stanley Rule and Level Co ... dis 60&10 %

Pumps.
Douglas Cistern, etc ... new list dis 25 %
" S. & F ... new list dis 20 %

Rakes.
Cast Steel ... dis 30 %

$8 00	9 00	10 00	11 00	
8	10	12	14	teeth.

Malleable ... dis 30 %

$5 50	6 00	6 50	
11	13	15	teeth.

Razor Strops.
Genuine Emerson ... dis 25 %
" " in 5 gross lots ... dis 30 %
Hunt's ... dis 35 %
Chapman ... dis 10 @ 15 %

Rivets.
Iron and Tinned ... dis 25 %
In bulk ... list net
Copper Rivets and Burrs ... new list dis 10 %

Rods.
Stair ... new list dis 30 %
American Patent ... dis 30 %

Rollers.
Barn Door ... revised list dis 60&10 %

Rope. Manufacturers' List
Manila ... ½ inch and larger ℘ ℔ 17 c
" ... ⅜ inch ℘ ℔ 17½c
" ... ¼ and 5-16 inch ℘ ℔ 18 c
" Lath Yarn, Fine Tar'd ... ℘ ℔ 18 c
" Hay Rope ... ℘ ℔ 17½c
Sisal ... ½ inch and larger ℘ ℔ 15½c
" ... ⅜ inch ℘ ℔ 16 c
" ... ¼ and 5-16 inch ℘ ℔ 16½c
" Hay Rope ... ℘ ℔ 16 c

Rules.
Chapin's Boxwood ... dis 60&10 %
" Ivory ... dis 50&10 %
Hubbard & Curtiss Mfg. Co ... new list net
Stanley Rule and Level Co.'s Ivory ... dis 50&10 %
" " " Boxwood ... dis 6 &10 %
Standard Rule Co.'s Boxwood ... dis 60&10 %
" " " Ivory ... dis 50&10 %

Sad Irons.
... ℘ ℔ 4½c net
Sad Iron, Nickel Stand attached ... ℘ ℔ 9c

Sand Paper—dis 7½ @ 10 %
Beader & Adamson's (Flint) 00 to 1½ ... $4 25 ℘ ream
" " 2, 2½ & 3 ... 4 75 "
Assorted ... 4 25 "
Star ... ℘ ream $3 25
Emery ... ℘ ream $6 50 @ 11 50
Cowdin Mfg. Co ... dis 7½ @ 10 %
Diamond Flint, 00 to 1½ ... per ream $4 25
" 2, 2½, 3 and assorted ... " 4 75
" Emery Paper ... per ream $6 50 to $11 50

Sash Locks.
Clark's ... dis 20 %
Ferguson's ... dis 20 @ 25 %
Norwich ... dis 15 %
Walker's ... list net

Sash Weights.
Solid Eyes ... ℘ ℔ 2½c

Sausage Fillers.
Perry's (P. S. & W.) ... dis 10 %

No.	1	0
℘ doz	$15 00	$21 00

Saw Rods ... dis 10 %

Saws.
Spear & Jackson's ... $4 50 to £ gold
John Spear ... $3 60 to £ gold
Am. Saw Co ... new list
Perforated Cross Cuts, all kinds ... 68c ℘ foot
Inserted Tooth ... dis 10 %
All else ... dis 12½ %
Disston's Circular ... dis 20 %
" Mill ... dis 25 %
" Cross Cut ... dis 15 %
" other kinds ... dis 12½ %
Livingston's Framed Wood ... dis 5 %
H. W. Peace's Circulars ... dis 10 %
Other kinds ... dis 10 %
Wm. McNiece's Hand, Cross Cut and Circular ... new list dis 10 %
E. M. Boynton's Lightning, dis 30&5 % for immediate cash
" Others ... dis 15 %

Saw Sets.
Nash's ... dis 20 %
Bemis' ... dis 10 %
Aiken's Genuine ... dis 25 %
Hotchkiss' ... dis 10 %
Common Lever ... per doz $1 80 net
Leach's ... dis 10 %

Scales.
Turnbull's ... dis 15 %
Brown's ... dis 25&5 %
Fairbanks' ... new list dis 15 @ 20 %
Howe's ... dis 15&5 %
Shattuck's Counter and Union ... dis 15 %
Chatillon's Grocers' ... dis 25 %
Eureka ... dis 25 %
Scale Beams ... dis 25 %
No. 1 300 to 1200 lbs ... 90c ℘ cwt
No. 2 " " ... 75c ℘ cwt

Screws.
American list of Jan. 1, 1874.
Flat Head Iron ... dis 52½ %
Round Head Iron ... dis 50 %
Flat Head Brass ... dis 52½ %
Round Head Brass ... dis 50 %
Round Head Silver Capped ... dis 25&10 %
Hand Rail ... dis 33⅓ %
Coach or Lag ... dis 30&10 @ 40 %
Coach, Patent Gimlet Point ... dis 5 %
Bed ... list net
English—Nettlefold & Chamberlain's Flat Head Iron ... dis 52½&10 %
Machine—Flat Head, Iron ... dis 60 %
" " Brass ... dis 10 %
Round Head, Iron ... dis 55 %
" Brass ... net
Bench—Iron, Wilson's ... dis 20 %
" —Wood ... dis 15 %
Hand ... dis 25&10 %
Jack—Bell Bottom ... dis 15 %

Scythes.
Blood's German Steel, Grass ... ℘ doz $9 00
" Cast " " ... ℘ doz 10 00
" Silver " " ... ℘ doz 11 00
" German " Grain ... ℘ doz 13 00
" Cast " " ... ℘ doz 14 00
" Red Rover ... 12 00
" Young America ... 9 50
" Silver Clipper ... 12 63
Scythe Snaths ... dis 20 %

Sieves.—Mann's Patent ... dis 15 %

Shears.
Cast Steel ... dis 60&10 %
Conn. Cutlery Co., new brand ... dis 60 %
Rowe's ... dis 50&10 %

Shovels and Spades.
Ames ... new list dis 12½ %
Rowland ... dis 20&5 %
Old Colony ... new list dis 10&5 %
N. B. Sherman ... old list dis 7½ %

Shovels and Tongs.
Iron Head ... list net
Brass Head ... dis 5 %
Polished Steel ... new list dis 15 %

Slates.
Square Frames, Round Cornered, by case ... dis 60&10 %
Less than a case ... dis 50 @ 55 %
Oval Frames, by case ... dis 40 @ 40&10 %
Less than a case ... dis 30 %

Spoons.
Iron ... new advanced list, dis 10 %
By the case ... dis 20 %
Britannia ... dis 40@40&10 %
Plated A 1 ... revised list dis 30&5 %
German Silver ... revised list dis 15&5 %
Tinned (P. S. & W.)—
Teas ... $1·50 ℘ gross, net
Tables ... 2·75 " net

Stocks and Dies.
... dis 15 %

Stove Polish.
Gem ... ℘ gross $5 00, dis 10 %
Joseph Dixon's ... ℘ gross, 6 00
National ... ℘ gross $4 75
Gold Medal ... ℘ gross $6 00, dis 15 %

Squares.
Steel ... dis 50 %; full cases, dis 50&10 %
Iron ... dis 50 %; full cases, dis 50&10 %
Nickel Plated ... add $2 50 @ $4 00 ℘ doz net
Try Squares and T Bevels ... dis 45&10 %
Star Try Squares and Bevels ... dis 30 %

Tacks.
Full Weight American Iron ... dis 40&7½ %
Half Weight American Iron ... dis 70&7½ %
Carpet ... dis 7½ %
Brads American Half Weight ... dis 50&7½ %

Finishing Nails	½	⅝	¾	1	1¼ in. and over
℘ ℔	25c	20c	18c	14c	13c dis 7½ %

Trunk and Clout	½	⅝	¾	1	1¼ in. and over
℘ ℔	25c	20c	18c	14c	13c dis 7½ %

Copper Tacks ... ℘ ℔ 50c—dis 7½ %
Iron Shoe Nails, ℘ ℔ 4-8 and longer, 10c; 3½-8, 10½c ... dis 7½ %
Double Pointed ... new list dis 33⅓ %

Tapes, Measuring.
American Flask and Cap Co ... dis 20 %
Eddy's ... dis 20 %

Thermometers.
Tin Case ... dis 50 %

Toe Calks.
... ℘ ℔ 13c net

Tobacco Cutters.
Champion ... dis 20&10 %
Peck, Stow & Wilcox ... dis 10 %

Tinners' Tools and Machines.
P. S. & W ... list net

Traps.
Newhouse ... dis 20 %
Hotchkiss ... dis 20&10 %
Peck, Stow & Wilcox ... dis 30 %
Blake's Patent ... dis 15 @ 20 %

Trowels.
Lothrop's Brick and Plastering ... dis 10 %
Disston's Plastering ... dis 12½ %
Disston's Brick ... dis 10 %
Rose's Brick ... dis 5 %
Brades' Brick ... gold, net
Worrall's Brick and Plastering ... dis 15 %
Garden ... dis 30 %

Vises.
Trenton Vises, Solid Box.
30 to 160 lbs ... 16c
160 and over ... 13c
Peter Wright's ... ℘ ℔ 15½c. gold
Wilson's Solid Box ... dis 15 %
30 to 160 lbs ... 18c
160 and upward ... 22c
Wilson's Parallel ... dis 30 %
Backus & Union, Parallel ... dis 25 %
Buffalo, Parallel ... new list dis 20 %
Fisher & Norris' Double Screw Parallel ... dis 15 @ 15&5 %
Trenton Parallel ... dis 15 %
Bonney's Saw Filers ... dis 20 %

Wheel Barrows.
Pugsley & Chapman—Canal ... dis 10&5 %
Coal, Garden and Stone ... dis 20 %

Wheel Heads.
Brass Bushed ... per doz $3 25 net

Well Wheels.
Revised list ... dis 55&10 %

Wire.
Bright and Annealed ... Nos. 0 @ 18 dis 35 @ 40 %
" " ... " 19 @ 26 dis 45 @ 50 %
" " ... " 27 @ 36 dis 50 @ 55 %
Coppered ... " 0 @ 18 dis 25 @ 30 %
Galvanized, Nos. 0 to 12 ... dis 40 @ 45 %
Galvanized, Nos. 13 to 18 ... dis 45 @ 50 %
Tinned ... dis 20 @ 25 %
Cast Steel ... 5 @ 10 %
Tinned Broom Wire ... dis 25 @ 30 %
Galvanized Telegraph, Nos. 8 and 9 ... ℘ ℔ 10c @ 11c
" " " 10 and 11 ... ℘ ℔ 11c @ 12c
" " " 12 ... ℘ ℔ 11½c @ 12½c
Annealed Fence, Nos. 8 and 9 ... dis 35 @ 40 %
" Grape, " 10 to 14 ... dis 35 @ 40 %
Fence Staples ... ℘ ℔ 8½ @ 9 %
Stubs' Steel Wire ... $7 00 to ℔ gold

Wrenches.
American Adjustable ... dis 45 %
Baxter's Adjustable "S" ... dis 20 %
" Diagonal ... dis 20 %
Collins & Co.'s ... dis 40 %
Coes' Genuine ... dis 40&5 %
" Pattern (Wrought) ... dis 50 %
" (Malleable) ... dis 60&10 %
Lindsay's Patent ... dis 25 %
Taft's Pattern ... dis 70 %
Davis' Patent Duplex ... new list dis 25 %
Bemis & Call's Patent Combination ... dis 20&5 %

Wringers.
Universal—Extra ... ℘ doz $72 00 @ —
Novelty ... ℘ doz 72 00 @ —
Sherman ... ℘ doz 67 00 @ —
Reliance ... ℘ doz 67 00 @ —
Providence ... ℘ doz 72 00 @ —
Monitor ... ℘ doz 65 00 @ —

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE.

Basins.
Wash Basins, Handled, Plain Stamped ... dis 25 %

Inch	10	11	11½
Per doz	$3·50	4·00	4·50

Wash Basins, Handled, Retinned ... dis 25 %

Inch	10	11	11½
Per doz	$4·00	4·50	5·00

Wash Basins, with Feet, Plain Stamped ... dis 25 %

Inch	10	11	11½	13½
Per doz	$2·00	2·50	2·85	3·75

Wash Basins, with Feet, Retinned ... dis 25 %

Inch	10	11	11½	13½
Per doz	$3·00	3·50	4·00	5·00

Wash Basins, Stamped ... dis 25 %

Inch	10	10½	11½
Per doz	$1·70	2·10	2·50

Inch Shallow	10	11
Per doz	$1·55	1·90

Wash Basins, Retinned ... dis 25 %

Inch	10	10½	11½
Per doz	$2·50	3·00	3·50

Inch Shallow	10	11
Per doz	$2·00	2·60

Covers.
Bucket ... dis 10 %

	1 pt.	1 qt.	2	3	4	6	8	10	12 qt.
Per gross	$2·25	3·00	4·00	4·50	5·75	7·75	8·75	9·25	15·00

Coffee Pot ... dis 10 %

	3 pt.	2 qt.	3	4	6 qt.
Per gross	$1·25	1·50	1·75	2·25	3·50

Pot ... dis 10 %

Inch	7½	7¾	8¼	8¾	9¼	9¾	10¼
Per gross	$5·50	6·00	6·75	7·25	8·00	8·50	10·25

Inch	10½	11¼	11¾	12¼	13¼
Per gross	$11·00	11·75	12·50	15·50	19·00

Tea Kettle Breasts and Covers ... dis 10 %

Inch	5¾	6¾	7¼	8	8½	9
Per gross	$6·00	6·50	8·00	9·00	9·75	10·50

Inch	9½	10	10½	11	11½	12½	13½
Per gross	$11·25	13·00	14·00	15·00	16·00	21·00	24·00

Dipper Bowls, Plain Stamped ... dis 25 %

Pints	½	¾	1	1½	Quarts	1	2	2½
Per doz.	·50	·60	·70	·80	Per doz	·90	1·25	1·50

Dipper Bowls, Retinned ... dis 25 %

Pints	½	¾	1	1½	Quarts	1	2	2½
Per doz.	·75	·95	1·00	1·15	Per doz	1·30	1·55	1·90

Pans.
Dish Pans, Tinned ... dis 25 %

Quarts	7	8	10	14	17	21	30
Per doz	8·50	9·50	11·00	13·00	16·00	19·00	30·00

Milk Pans, Plain Stamped ... dis 25 %

Quarts	½	1	1½	2	3	4	5	6	8	10
Per doz	$ ·85	1·05	1·20	1·45	1·65	2 40	2·90	3·15	4·40	5·00

Milk Pans, Retinned ... dis 25 %

Quarts	½	1	1½	2	3	4	5	6	8	10
Per doz	$1·15	1·40	1·60	1·90	2·15	3·00	3·40	3·80	5·20	6·00

Pie Plates ... dis 10 %

Inch	6	7	8	9	10	11
Per gross	$4·50	5·00	7·25	7·75	10·50	12·00

JAPANNED TIN WARE.

Cannisters, Common ... dis 10 %

Pound	½	1	2	3
Per doz	$1·10	1·60	2·50	3·25

Cannisters, Hinged ... dis 10 %

Pound	1	2	3	4	6
Per doz	$1·75	2·75	3·40	3·75	4·50

Candlesticks, Japanned ... dis 10 %

No	1	2
Per gross	$8·00	7·00

Cake Boxes, Round ... per nest, $3·25, dis 10 %
" Square ... per nest, 4·25, dis 10 %
Chamber Pails, Japanned (Smith, Burns & Co.) ... dis 10 %

Nos	2	3	4	5
Green, per doz	$8·00	9·00	10·50	12·50
Oak "	$9·50	10·50	12·00	13·50

Dust Pans, Corrugated ... per gross, $22·00, dis 10 %
Box Graters ... per gross, $4·00, dis 10 %
Molasses Cups ... dis 10 %

Pint	½	1	2
Per doz	$1·25	·50	2·75

Pepper Boxes Japanned ... dis 10 %
Per gross ... Small, $3·00; Large, $4·00
Toy Banks, House ... dis 0 %

No	1	2
Per gross	$7·00	5·50

Toy Banks Gothic ... dis 10 %

No	1
Per gross	$5·50

Toy Cups, Straight ... dis 10 %

No	1	2	3
Per gross	$4·00	3·50	3·50

Toy Cups, Flaring, nests of (3) ... per gross, $2·50, dis 10 %
Toy Pails, Covered ... dis 10 %

No	1
Per gross	$4·50

Toy Rattles ... per gross, $2·25, dis 10 %
Trunks, Wire Handled ... per nest (5) $1·50, dis 10 %
Spittoons, Tin ... per gross, No. 2, $30, No. 3, $27, dis 10 %

PLANISHED TIN WARE.

Planished Coffee Pots, Round ... dis 25 @ 30 %

Pints	1	2	3	4	5	6	7	8
Each	·60	·75	·85	·95	1·15	1·25	1·30	1·40

Planished Tea Pots, Round ... dis 25 @ 30 %

Pints	2	3	4	5	6
Each	·70	·80	·95	1·05	1·25

Planished Tea Pots, Oval ... dis 25 @ 30 %

Pints	1	2	3	4	5	6	7
Each	·70	·80	·90	1·05	1·15	1·40	1·75

Planished Pepper Boxes, No. 1 ... per doz., $1·52
Planished Flour Dredges, No. 3, $2·10; 4, 2·45 ℘ dozen.
Planished Round Coffee Biggins ... dis 25 %

Pints	2	3	4	5	6	8
Each	$1·00	1·10	1·20	1·40	1·60	2·00

Planished Oval Coffee Biggins ... dis 25 %

Pints	2	3	4	5	6	8
Each	$1·15	1·25	1·40	1·60	1·80	2·25

Planished Oval Chafing Dishes, Imperial Covers ... dis 25 %

Inch	10	12	14	16	18	20	22	24
Each	$3·85	5·00	6·25	7·60	9·00	11·50	15·00	16·50

Planished Oval Chafing Dishes, Low Covers ... dis 25 %

Inch	10	12	14	16	18	20
Each	$3·25	4·35	5·20	6·20	7·80	9·25

Planished Low Dish Covers ... dis 25 %

Inch	10	11	12	14	16	18	20
Each	$ ·70	·80	1·00	1·25	1·50	2·00	2·75

Planished Imperial Dish Covers ... dis 25 %

Inch	10	11	12	14	16	18	20	22	24
Each	$1·55	1·70	2·00	2·60	3·15	3·45	4·60	5·45	6·30

Planished Etnas, on Stands ... dis 25 %

Pints	1½	2	3	4	5
Each	$0·90	1·00	1·20	1·50	1·75

Planished Liquor Mixers ... dis 25 %

Nos	0	1	2
Per doz	$2·00	2·10	2·45

Planished Oval Melon Molds ... dis 25 %

Nos	2	3	4	5	6	7	8	9
Each	$ ·60	·65	·70	·80	·90	1·00	1·15	1·35

Planished Oval Tumbler Warmers ... dis 25 %
To fit 1, 2, 3, and 4 O. G. Urns ... each, $2·50
Planished Oval O. G. Urns ... dis 25 %

Nos	0	1	2	3	4	5	6	7	8
Each	$4·90	5·45	6·30	7·00	7·75	9·25	11·25	12·50	15·50

Planished Round Urns ... dis 25 %

Nos	0	1	2	3	4	5	6	7
Each	$4·20	4·85	5·45	6·30	7·75	9·00	11·00	14·25

Planished Round Oyster Dishes, (Complete) ... dis 25 %

Nos	1	2
Each	$2·10	2·80

Planished Oyster Dish Plates ... dis 25 %

Nos	1	2
Each	$0·25	0·30

Oyster Dish Covers ... dis 25 %

Nos	1	2
Each	$0·30	0·35

Tea Pot Handles—P. S. & W ... dis 20 %
Stow's Patent Hollow Tea Pot Handles.
No. 1, Small, 4½ inches ... per gross, $11·50
No. 2, Medium, 5¾ " ... " 12·50
No. 3, Large, 6½ " ... " 13·50
No. 4, Ex. Large, 7½ in., for Wash Pitchers, &c ... " 18·00
Stow's Patent. New Pattern.
No. 25, Small, 4½ inches ... per gross, $11·50
No. 35, Medium, 5¾ " ... " 12·00
No. 45, Large, 6½ " ... " 13·00
Solid Iron, Tin Tipped.
No. 10, Small, 4½ inches ... per gross, $9·00
No. 15, Medium, 5¾ " ... " 9·50
No. 20, Large, 6½ " ... " 10·75
Stow's Patent Hollow Tea Pot Handles, Adamantine

Bronze—P. S. & W.

No. 12, Bronzed and Tin-Tipped.....per gross, $13 50

Saucepan Handles. Of Best Malleable Iron.

P. S. & W.....dis 20 %

Japanned.

No. 1, 5½ inches long.....per gross, $3 50
No. 2, 6 " " " 3 75
No. 3, 6½ " " " 4 00
No. 4, 7¼ " " " 4 25
No. 5, 8 " " " 4 50
No. 6, 9 " " " 4 75

Tinned.

No. 1, 5½ inches long.....per gross, $4 25
No. 2, 6 " " " 4 50
No. 3, 6½ " " " 4 75
No. 4, 7¼ " " " 5 25
No. 5, 8 " " " 5 50
No. 6, 9 " " " 5 75
Japanned.....per lb., 16
Tinned....." 20

Iron Kettle Ears (P., S. & W.).....dis 45 %

Half gross pairs in a package.

METALS.

IRON.—DUTY: Bars, 1 to 1½ cents per lb., Sheet, Band, Hoop and Scroll, 1¼ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1½ cents per lb.

Pig Iron—AMERICAN.

Foundry No. 1	₩ ton,	$34 00 @	35 00
Foundry No. 2	"	31 00 @	33 00
Gray Forge	"	27 00 @	31 00
White and Mottled	"		

SCOTCH.

Coltness		39 00 @	40 00
Glengarnock	"		38 50
Eglinton	"		37 00

Bar Iron.

Am. Refined, at mill.....₩ lb 3·1c @ 3 3c

Rails.

Welsh, gold	₩ ton,	54 00 @	58 00
American, at works, currency	"	55 00 @	60 00
Old Rails, T, currency	"	40 00 @	

Scrap.

Wrought Scrap, from yard..... " 40 00 @ 42 50

Bar Iron from Store.

Common Iron.

⅜ to 2 in. round and square	₩ ton,	$ 70 00
⅝x9-16 in " "	"	75 00
½ in. " "	"	77 50
2½ to 3 in. "	"	75 00
1 to 6 in. wide x ⅜ and 1 in. thick	"	70 00
1¼ to 6 in wide x ½ & 5-16 in. thick	"	75 00
1 and 1¼ in. x ½ and 5-16	"	82 50

Swedish Iron

1¼x⅜ and ½	"	170 00
1¼x⅜ to ⅝, and ¾ square	"	165 00
1¾ to 5x⅝ to ¾ and ⅞ to 2-in. square	"	160 00
6 to 8x⅝ and ½	"	170 00

Refined Iron.

⅜ to 2 in. round and square	"	72 50
1 to 6 in. wide x ⅜ to 1 thick	"	72 50
1¼ to 6 in wide x ½ and 5-16 thick	"	77 50
1 and 1¼ x ½ and 5-16	"	77 50

Large Rounds.

2⅝ to 2¾, round and square	"	80 00
3, 3¼ and 3½ in	"	85 00
3¾ and 4 in	"	92 50

Rods—⅜ and 11-16, round and square..... " 77 50
⅝ and 9-16, " " " 80 00
7-16, " " " 85 00
¾, " " " 90 00
5-16, " " " 95 00
⅛, " " " 100 00
3-16, " " " 127 50

Band Iron.

1 to 6 in. x 3-16 to No. 12	"	92 50

Horse Shoe Iron.

⅜ and ½ x ⅜, to ½	"	107 50
1 x ⅜, to ½	"	

Ovals, Half Ovals and Half Rounds.

¼ to 1½	₩ ton,	$ 97 50
⅜ and 11-16	"	102 50
½ and 9-16	"	107 50
7-16	"	
⅝	"	

Nail Rods

Best Norway	₩ lb	8½ @ 9c

Norway Shapes

¼ to 2 in. x ¼ to ⅝	₩ lb	8½c
¼ to ⅜ square	"	

Norway Bar

¼ to 2 in. square	"	7¾c

Spring Steel

1 to in. wide	"	7¾c

Tire Steel

⅜ to 1½ x ½ and 5-16	"	8½c
⅝ & 1 x 3-16	"	9¾c
⅝ & 1 x ¼	"	

Toe Calk Steel

½ to ¾ x ⅜ to ½	"	7¾c

Plow Steel

6 to 16 wide	"	8½c

Sleigh Shoe Steel

¼ to 1½ x ⅜ to ⅝		6¾c
Hoops, ⅜ x No. 22	₩ ton	$160 00
" ⅝ x No. 20	"	130 00
" ¾ x No. 19	"	125 00
" 1 and 1¼ x No. 18	"	115 00
" 1¼ to 2 and 1x1¼ x No. 13 and 14	"	105 00
Scroll Iron—⅛ x 12	"	132 50
" ¼ x 10	"	122 50
" ¼ x 3-16	"	127 50
" ¼ x ¼	"	122 50
" ¼ x 14	"	132 50
" ⅜ x 12	"	120 00
" ⅜ x 10	"	117 50
" ⅜ x 3-16	"	115 00
" ⅜ x ¼	"	112 50
" ⅜ x 13	"	115 00
" ⅜ x 10	"	112 50
" ⅜ x 3-16	"	110 00
" ⅜ x ¼	"	107 50
" ⅜ x 14	"	
" ½ x 12	"	110 00
" ½ x 10	"	107 50
" ½ x 3-16	"	105 00
" ½ x ¼	"	102 50
" ½ x 14	"	120 00

Sheet Iron.

	Common English.	R. G. American.	R. G. English.
Nos. 10 to 20 ₩ ₩	4½ @ 4¾c	5½c	6c
21 to 24 "	5 @ 5¼c	6c	6½c
25 to 26 "	5½c	6¼c	6¾c
27 "	5¾c	6¾c	7c
28 "	6c	7c	7¼c
30 "	7¼c		

Galvanized, 10 to 20, prime	₩ ₩	10½c
" 21 to 24	"	11½c
" 25 to 26	"	12½c
" 27	"	13½c
Patent Polished	"	15 @ 16c
Russia, Nos. 8 to 11	₩ ₩	19c
" Nos. 12 to 16	"	19c
" Stained, No. 1	"	17½c
Belgian	"	12c

One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON

4½	5	5¼	6	7 inch.
$3·75	4·25	5·25	5·25	6·50 per doz.

RUSSIA IRON.

4½	5	5¼	6	7 inch.
$8·00	10·00	12·00	12·00	14·00 per doz.

Adjustable Stove Pipe Elbows.

CHARCOAL IRON.

4	4½	5	5¼	6	7 inch.
$3·25	3·75	4·25	4·75	5·25	6·25 per doz.

RUSSIA IRON.

4	4½	5	5¼	6	7 inch.
$7·00	8·00	9·50	10·25	11·75	13·75 per doz.

Discount on orders of 10 doz. 5 %.
" " " 25 doz. 10 %.

Brass.

ROLLED AND IN SHEETS.
(Brown & Sharp's Gauge.*)
For the purchase of 100 pounds and over at one time

HIGH BRASS.

All Nos. to No. 28, and widths 14 in. and under.....34c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in. inclusive.....37c
Over 20 in. to 30 in. inclusive.....40c
¼c ₩ lb advance on each No. above No. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass at.....38c
Sheets 24x48 in., and all sheets cut to particular sizes and lengths.....40c
Platers' Rules.....44c
Sheets wider than 30 in. and under 40 in.....44c
" 40 in. and over.....46c
Circular sheets, in diam. from 4 in. to 14 inclusive....41c
" " " over 14 in. to 20 " 47c
" " " " 20 in. to 30 " 50c
" " " " 30 in. to 40 " 53c
" " " " 40 in.....56c
Brass Rods above No. 0, and under 1 in.....43c
" " 1 in. and over.....47c

LOW BRASS.

4c ₩ lb more than High Brass.
Gilding Metals, 7c ₩ lb more than High Brass.
Platers' or Gold Metal { ½ in Bars..... 46c / Sawed..... 49c

FOR SLITTING: Metal in Width.

2in. to ¼ in., to No. 30, inclusive, 1c ₩ lb advance.
2 in. to 1 in., thinner than No. 30, 2c ₩ lb advance.
2 in. to ¼ in.. " " 30, 3c " "
½ in. and less to No. 30, 2c ₩ lb advance.
½ in. and less thinner than No. 30, 5c ₩ lb advance.
10 % discount.

SCRAP—NEW METAL.

High Brass Scrap, 17 cents, net.
Low " 19 " "
Gilding, 21 cents, net.
Turnings, Fillings and Chips, half the price of Scrap net.

BRASS AND COPPER WIRE.
(Stub's Wire Gauge).

	High Brass.	Low Brass.	Gild'g and Cop'r
Nos. 0 to 20	37	41	47
Nos. 21, 22, 23	38	42	48
Nos. 24 and 25	39	43	49

Brass Wire straightened and cut, 4 cents advance
10 % discount

FINE WIRE—NET PRICES.

	High Brass.	Low Brass.	Gild'g and Cop'r
No. 26	0·41	0·45	0·51
No. 27	0·44	0·48	0·54
No. 28	0·46	0·50	0·56
No. 29	0·48	0·52	0·58
No. 30	0·50	0·54	0·62
No. 31	0·52	0·56	0·66
No. 32	0·56	0·60	0·71
No. 33	0·60	0·64	0·81
No. 34	0·64	0·68	0·91
No. 35	0·69	0·73	1·03
No. 36	0·78	0·82	1·15
No. 37	0·94	0·98	1·28
No. 38	1·28	1·26	1·58

Ten cents per pound extra for Spooling.

TUBING.
(Brown & Sharpe's Gauge.)

	₩ lb
Plain to No. 20, inclusive	$0·52

Nos. 21, 22 23, 2c. advance on List for each No.
Nos. 24, 25, 26, 4c. " " "
Above No. 26 special rates.

Plain Tube, 1-4 inch	68
" 3-16 "	1 53
" 1-8 "	1 78

All Mandrel-Drawn Tubes 5c. advance on List.
Fancy Tubing 4c. advance on List above Plain.
English, Scotch, and Extra Patterns Fancy Tubing to No. 20 61
Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List.
Add to two cents a half-cent for each additional cutting under two feet. 10 % discount.
BRASS DOOR RAIL—48 cents per lb.—10 % dis.

BELT AND HOSE COPPER RIVETS AND BURS.

Price per ₩	49	50	52	54	56	58	60	64	68c
Nos.	7	8	9	10	11	12	13	14	15

Braziers Rivets, 43 cents per pound discount 10 %.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire
4 per cent. 12 inch. to No. 26	0·75	0·90
6 " " "	0·85	1·00
10 " " "	1·05	1·25
15 " " "	1·30	1·55
18 " " "	1·45	1·75
24 " " "	1·55	

Discount 10 %.

German Silver Sheet 1 ver 12 inches wide and weighing more than 10 lbs.....@ 10 ₩ lb net
Advance two cents for each additional inch in width above 12 inches, and two cents per pound on each No. thinner than Nos. 26 to 36, inclusive.
All German Silver thinner than No. 36 is Platers' at 50 cents per pound additional.
German Silver Scrap, one-third less than net price of 12 inch Market Metal; German Silver Turnings, Fillings and Chips, half the price of Scrap.
* Brown & Sharp's Gauge is about two numbers finer than Stubs' Wire Gauge.

COPPER—DUTY: Pig, Bar and Ingot, 5c.; old copper 4 cents ₩ lb; Manufactured (including all articles which copper is a component of chief value) 45 % ad valorem. All subject to a reduction of 10 per cent.

American Ingot	₩ lb 26 @ 26½c
English	"

SHEATHING, BRAZIERS COPPER, BOLTS, &C.

Braziers Copper, ordinary sizes, over 16 oz., per square foot	35c ₩ lb
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot	38c. "
Braziers Copper. 12 oz. per square foot and lighter.	41c. "
Circles less than 24 inch in diameter	38c. ₩ lb
Circles, 24 inch diameter and over	41c. "
Segment and Pattern Sheets	38c. "
Locomotive Fire Box Sheets	35c. "
Sheathing Copper, over 12 oz. per sq. ft.	33c. "
" 12 oz. ₩ sq. ft. and lighter	41c. "
Bolt Copper	35c. "

No Copper is Sheathing except 14x48 inches, and not to exceed 24 oz. to the square foot.

TINNING.

14x48, by the case	8c. ₩ sheet
14x48, less than case	10c. "
Boiler Sizes, 7 and 8 inch	12c. "
" 9 inch	15c. "
Other sizes not larger than 30x60	2½c. ₩ sq.
Larger than 30x60	5c. "
Copper Bottoms 34 @ 36c. ₩ lb	net

O'NEILL'S PATENT PLANISHED COPPER.
14x48.

14 and 16 oz. and heavier	39c. By the case, 38c. ₩ lb
12 oz. and lighter	42c. " " " 41c. "

Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x10
14 and 16 oz. and heavier.....41c. By the case, 40c. ₩ lb
(And all sizes not over 20 inches wide.)
50x60

14 and 16 oz. and heavier	43c. ₩ lb
12 oz	46c. "

LEAD—DUTY: Pig, $2 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb. All subject to a reduction of 10 per cent.

Spanish	6½ @ 6¾c gold
German Refined	6½ @ 6¾c gold
English	6½ @ 7c gold
American	6½ @ 6¼c gold
Bar	dis 10 % 8½c.
Pipe	dis 10 % 9c.
Tin Lined Pipe	dis 10 % 16½c.
Sheet	dis 10 % 9c.
Shot	dis 10 %, Drop, 9c.; Buck, 9½c.
Solder	No. 1, 16 @ 17c.; No. 2, 15c

STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb.; over 11, 3½ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. All subject to a reduction of 10 per cent. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as Steel.

American Cast Steel.

Tool	16c
Spring	12½c
Homogeneous	12½c
Tire	12½ @ 13½c
Machinery (round and square)	11½ @ 12c
File	12½c
Sheet	14 @ 16c
Saw Plate, mill and mulay	14 @ 16½c
Saw Plate, gang and X cut	13 @ 14c
" circular as to size	18 @ 30c

Chrome Steel.

Tool	₩ lb 20 @ 21c
Tool, extra fine	" 40 @ 75c
Spring	₩ lb 12c and upward
Machinery	₩ lb 14c.
Hammer	" 15c.
Gun or Homogeneous	" 16c

English Steel.—payable in gold, dis 5 % cash.

Best Cast	₩ lb	18c
Extra Cast	"	19c
Round Machinery, Cast	"	11½c
Swaged, Cast	"	18c
Best Double Shear	"	18c
Blister, 1st quality	"	13½c
" 2d quality	"	11½c
" 3d quality	"	10½c
German Steel, Best	"	11½c
do 2d quality	"	10½c
Sheet Cast Steel, 1st quality	"	18c
" 2d quality	"	16c
" 3d quality	"	14c
File Steel, Flat and ½ Round	"	12½c
" Square and Round	"	13c
" Mill	"	13½c
" Taper to 4 inch	"	11c
" Taper 3 and 3½ inch	"	18c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.—less 10 per cent.

Silesian, cash	6¾ @ 7c, gold
American "	7¾ @ 11c., currency

TIN—DUTY: Plates, Sheets, Tagger and Terne, 15 per cent. ad val.; Electro-galvanized Plates, 2 cents per lb.; Manufactures of, not enumerated, 35 per cent. ad val. —all subject to a reduction of 10 per cent. Bars, Block and Pigs, free. Bancs, subject to duty of 10 per cent.

Banca	₩ lb 28c., gold
Straits	₩ lb 26½ @ 27c, gold
English	₩ lb 25 @ 24c., gold

CHARCOAL TIN PLATE.

I C 10x14. Prime Charcoal	12·25
12x12, "	12·75
14x20, "	13·00
I X 10x14, "	14·50
12x14, "	15·00
14x20, "	15.50
D C 12½x17 "	11·75
D X 12½x17 "	14·00
For each additional X add	2·25

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$11·25 @ 11·50	10·25 @ 10·50	9·25 @ 9·75
I C 12x12	11·75	11·00	
I C 14x20	12·00	11·00	

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$11·00 @ 11·25	10·00 @ 10·75	7·25 @ 9·75
I X 14x20	13·75		
I C 20x28	23·75	21·50 @ 23·25	19·00 @ 21·50
I X 20x28	28·50	27·50	
I C 20x200 ft.	25·00		

ZINC—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet, 2½c. ₩ lb. All subject to a reduction of 10 per cent.

Sheet	cask 9½c
"	open 10c

Paper Stock, Old Metals, &c.

(Dealers' Selling Prices.)

Canvas linen		6¾ @
" cotton. No. 1		@ 7
" " No. 2		@ 4
White linen rags. No. 1		@ 7¼
" " No. 2		@ 5
Colored		2½ @
Mixed woolens		@ 3
Soft woolens		@ 6¼
Gunny bagging		1¾ @ 2
Jute Butts		2¾ @ 2¾
Kentucky bagging		5¼ @ 5¾
Book stock		4 @ 4¼
Waste paper and scraps		1½ @ 3
Hope cuttings		1½ @ 3
Kentucky Bale rope		4 @ 4¼
Oakum junk, No. 1		5¼ @ 5¾
" No. 2		4 @ 4¼
Grass rope		4 @ 4¼
Tarred Shaking		1½ @ 2
White Collar Cuttings, all paper		7 @ ..
" " muslin lined		5 @ ..
" Envelope "		7 @ ..
Hard White Shavings, No. 1		6¼ @ ..
Soft " No. 1		6 @ ..
White Shavings, No. 2		5¼ @ 6
Mixed Shavings, part white		4 @ 4¼
Imperfections, No. 2, best folded sheets		5 @ ..
" " 1, Heavy Stock		4¾ @ 5
Book Stock, Mixed		3½ @ 4
" " No. 2, light		2¾ @ 3
Prints		1½ @ 2
Pure Manilas		2¾ @ 2¾
Bogus Manilas and Hardwares		1¾ @ 1¾
Commons		1 @ ..
Binders' Board Cuttings		1¾ @ 2
Straw Board Cuttings		1¼ @ 1¾

Old Metal.

Copper	22	@ 23
Yellow metal	16	@ 17
Brass	16	@ 17
Heavy Composition	19	@ 20
Old lead, solid		6½
Tea lead		5½
Wrought iron	1½ @	1⅝
Sheet Iron	0⅞ @	
Cast iron	1 @	1¼
Machinery iron	1¼ @	1½
Zinc		5½
Pewter, No. 1	23	@ 24
" No. 2	10	@ 12
Spelter		

Paints, Oils, etc.

Paints.

Black, lamp—Coach Painters	₩ lb	30c
" " Ordinary		8c
" Ivory Drop, fair		17c
" " best		20c
Black Paint, in oil	kegs, 8c.; asst'd cans, 11	c
Blue, Prussian, fair to best		50 @ 75c
" " " in oil		35 @ 45c
" Chinese, dry		8c
" Ultamarine		25 @ 30c
Brown, Spanish		14c
" Van Dyke		9c
Carmine, 40		$12 00
Green, Chrome		15 @ 25c
" " in oil		18 @ 25c
" Paris	good, 30c; best, 40c	
" " in oil	" 30c; "	45c
Mineral Paints		1¼ @ 4c
Orange Mineral		14½c
Red Lead, American		9¼c
" " English		10½c
" Venetian (N. C.) dry		2¾c
" " in oil	asst'd cans, 11c; kegs, 8	c
" Indian, dry		10c
Rose Pink		13c
Sienna, American, Raw		4c
" Burnt		4½c
" " in oil		16 @ 20c
" Raw "		15 @ 25c
Umber, Burnt		4 @ 8c
" " in oil		16 @ 21c
" Raw		3½ @ 7½c
" " in oil		16 @ 22c
Vermillion, Chinese		$1 62
" English		1 75
" Trieste		1 52
" American, Common		25c
White Lead, American, pure dry		10½c
" " " in oil		11½c
White, Paris, English, prime	in bbls.	2½ @ 2¾c
Yellow Ochre French		2½ @ 2¾c
" " in oil	asst'd cans, 11c; kegs, 8	c
" Vermont	in casks	1½c
" Chrome		17 @ 21c
" " in oil		18 @ 28c
Zinc White, American No. 1 dry		9c
" " " in oil		11c
" French (Paris)		11 c
" " in oil		12

Oils.

Linseed Raw	₩ gal. casks, 97c, bbls.	98c.
" Boiled	" $1·02 "	$1·03
Whale, Crude	"	
" Bleached Winter	"	
Sperm, Crude	"	1·70
" Winter unbleached	"	1.80
" Bleached	"	1·75
Seal, Extra Refined	"	
Lard, Pure Winter	"	82c
" Spring	"	
Cotton Seed, Crude	"	42½c
" Southern Yellow		46½c @ 47½c
" White		
Neatsfoot, Winter		70c @ $1·10
Natural Lubricating		38c @ 40c

Sundries.

Asphaltum		9c
Benzine	₩ gal.	16c
Chalk		1½c
" Block		
Dryer, Patent, Am'n	ass't cans, 10½c.; kegs	9c
" English	" 11c.; "	9c
Flocks		
Frostings		50c
Glue, White		33 @ 47c
" Sheet		30c
Glaziers' Points, Zinc		9c
Gum, Copal		36c
" Damar		25c
" Shellac, English		60c
" " dark		50c
Litnarge		10c
Pumice Stone, selected Lumps		4 @ 6c
" powdered		4c
Putty in bladders		3½c
" in bulk		3c
Rotton Stone, soft, English		8c
Spirits Turpentine		48c
Whiting, Spanish		1c

Glass.

French Windows—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.

SINGLE.

SIZES.	I.	II.	III.	
6 x 8 to 10 x 15	$10·25	$9·25	$8·75	$8·00
11 x 14 to 16 x 24	12·00	11·00	10·00	9·50
18 x 22 to 20 x 30	15·00	13·50	12·00	10·50
15 x 36 to 24 x 30	17·50	15·25	12·50	
26 x 28 to 24 x 36	18·25	16·00	13·25	
26 x 36 to 26 x 44	20·00	18·00	14·50	
26 x 46 to 30 x 50	21·00	19·00	15·25	
30 x 52 to 30 x 54	22·50	20·25	16·25	
30 x 56 to 34 x 56	24·50	21·75	19·00	
34 x 58 to 34 x 60	26·00	24·50	21·50	
36 x 60 to 40 x 60	30·50	27·00	24·50	

DOUBLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$16·50	$15·00	$14·00	$13·00
11 x 14 to 16 x 24	19·25	17·75	16·00	15·25
18 x 22 to 20 x 30	24·00	21·75	19·25	
15 x 36 to 24 x 30	28·00	24·50	20·00	
26 x 28 to 24 x 36	29·25	25·75	21·25	
26 x 36 to 26 x 44	32·00	29·00	23·25	
26 x 46 to 30 x 50	33·75	30·50	24·50	
30 x 52 to 30 x 54	36·00	32·50	26·00	
30 x 56 to 34 x 56	39·25	35·00	30·50	
34 x 58 to 34 x 60	41·75	39·25	34·75	
36 x 60 to 40 x 60	49·00	43·25	39·25	

Sizes above—$12·00 per box extra for every 5 inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.
Discounts 50 %, 10 % and 5 % to 60 %.

Hardware.

ESTABLISHED IN 1849.

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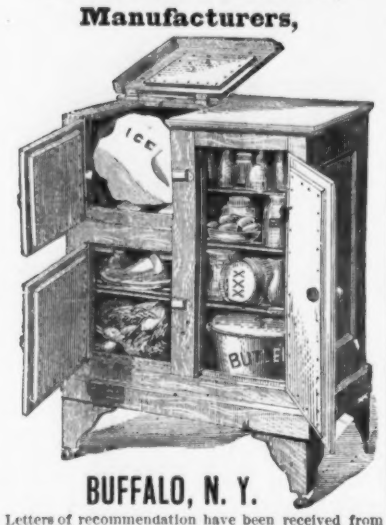
Manufacturers,



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MAGILL BROS.	Louisville, Ky.
KETCHAM & VIOT	Toledo, Ohio.
F. WETMORE & CO.	Detroit, Mich.
S. P. PIERCE & CO.	Syracuse, N. Y.
FARES & FISCHER	Cincinnati, O.
KENNEDY, DEFOREST & RANDALL	Cleveland, O.
W. W. PIERCE & CO.	Erie, Pa.
R. L. McCUAT	Indianapolis, Ind.
E. A. BURROWS & CO.	Troy, N. Y.
STOWELL, PLOWMAN & CO.	Elmira, N. Y.
MILLS & DAVIS	Pittsfield, Mass.
BENSON & GILLESPIE	Binghamton, N. Y.
JOHN MACLAY	Dubuque, Iowa.
DEMMLER BROS.	Pittsburg, Pa.
G. & C. W. BILLINGS	North Adams, Mass.
HOPSON & SHEPARD	Utica, N. Y

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WITH

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MEAT, FRUIT & ICE PRESERVER

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PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout. And not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench. Thus making a Combination which has no equal.

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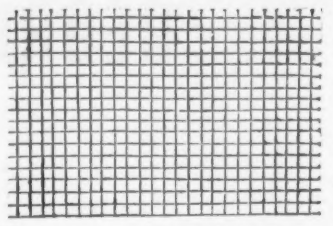

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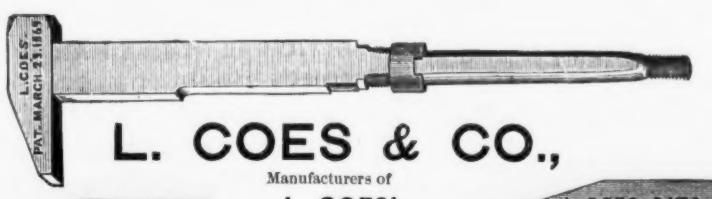
To buyers of Wire Cloth we give the assurance that our imported Screen Cloth is of best quality and finish—it excels in beauty and durability of color. We keep plain, green, gray, black, fancy patterns and landscape in stock, and all orders for ordinary widths from 24 to 48 inches will be promptly executed. Prices guaranteed satisfactory.



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There are *Imitations* of our goods offered for sale, that, without question, infringe on our Patents.

We hold Patents bearing date Nov. 10th, 1863 (re-issued June 1st, 1869). June 26th 1866, March 23d, 1869 (re-issued April 13th, 1870, and May 14th, 1872), which fully cover all our improvements. One of the above cuts represents a sectional view, showing the nut under the ferrule, and the strengthened bar, that part being covered by the jaw, as seen in the cut of wrench complete. None genuine unless stamped

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Oval, Square and Round Wash Boilers, Tea Kettles, Coffee Pots, Fluted, Octagon, Oval and Round Tea and Coffee Pots.

Japanned and Galvanized Chamber Pails, Water Pails, Well Buckets, Ash Cans, EXCELSIOR Fry Pans, Broilers, &c.

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Patent Corrugated Riveted Bottom

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BUTCHERS' STEELS,

AND

SHOE KNIVES.

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The only self-regulating Steam Trap in the world. For full description send for circular to

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We invite attention to the superior construction of this chuck. Its working parts are **absolutely protected from dirt and chips.** It is strong, compact and durable, and will hold the greatest variety of work, as the jaws are adjustable with a range the full diameter of the chuck. For Price List, address,

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Proprietors of **TRENTON VISE AND TOOL WORKS, Trenton, N. J.**—Vises, Picks, Mattocks, Grub Hoes, Sledges, Hammers, Bridge Work, Turn Tables, etc.
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Sole Agents for **LAMSON & GOODNOW MFG. CO., Shelburne Falls, Mass.**—Table Cutlery and Butcher Knives.
W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States.
Geo. Wostenholm & Son's Knives, Scissors and Razors, the largest stock in the U. S.
John Wilson's Butcher and Shoe Knives.
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We always have on hand a full assortment of

German and English Hardware, Cutlery, Guns, Gun Material, Chains, Heavy Goods.

SPEAR & JACKSON

Sheffield, England,

MANUFACTURERS OF

Saws, Files, Edge Tools and Steel.

JOHN L. FISHER. Agent
116 Duane Street, NEW YORK.

ROY & COMPANY,

West Troy, N. Y.,

Manufacturers of

Wrought Iron Butts, Strap and T Hinges,

PLATE AND HOOK HINGES,
Cold Pressed Nuts and Washers, Felloe Clips, &c
JOHN L. FISHER, Agent, 116 Duane Street, New York.

STANLEY WORKS,

MANUFACTURERS OF

Wrought Butts, Strap and T Hinges.
Bronzed Butts and Bolts.
Wrought Barrel, Square and Shutter Bolts.
Wrought Chest Handles, Washers, Flush Bolts, &c.

79 CHAMBERS ST., NEW YORK.
Factory at New Britain CONNECTICUT.

CROOKE & CO.,

MANUFACTURERS OF

WROUGHT IRON BUTTS,

All our goods are manufactured from patent faced iron plates; they have a smooth face and bright finish.
163 & 165 Mulberry Street. New York.

QUACKENBUSH, TOWNSEND & CO.,

Successors to
SEARS, LEAVITT & CO.,
Importers and Wholesale Dealers in

Hardware, Cutlery, &c.,

59 and 61 Reade Street, New York.

THOMAS JOWITT & SONS, (Sheffield, England,) Celebrated FILES AND HORSE RASPS. Rough and Ready and CLIPPER SCYTHES, Warranted.

DEPOT FOR

"BEAVER" (American,) FILES AND HORSE RASPS. "WIDE AWAKE" AXES.

ESTABLISHED IN 1849.

JOHN C. JEWETT & SONS, Buffalo, N. Y.

MANUFACTURERS OF

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BIRD CAGES.

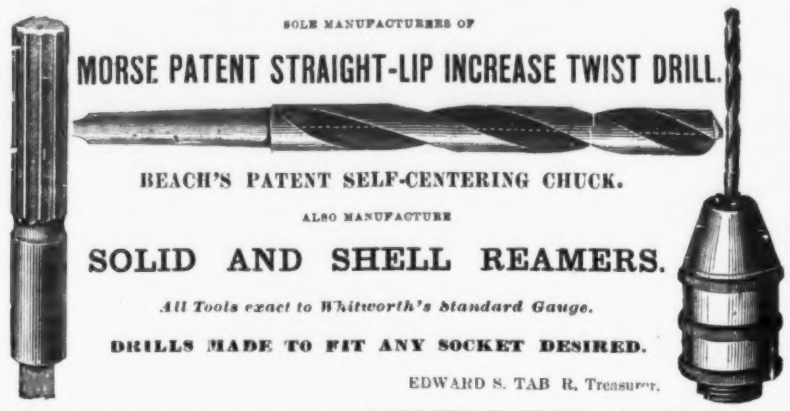
Water Coolers, Water Filters, Bathing Apparatus, Tea Trays, &c.

Send for Illustrated Catalogue.

Morse Twist Drill and Machine Company,

New Bedford, Mass.,

SOLE MANUFACTURERS OF



MORSE PATENT STRAIGHT-LIP INCREASE TWIST DRILL.

BEACH'S PATENT SELF-CENTERING CHUCK.

ALSO MANUFACTURE

SOLID AND SHELL REAMERS.

All Tools exact to Whitworth's Standard Gauge.

DRILLS MADE TO FIT ANY SOCKET DESIRED.

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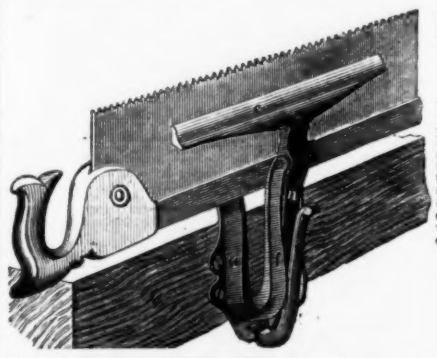


Stearns' Patent Saw Vise

No. 1.

This simple and effective device for holding saws for the operation of filing is too well known to require more than a passing description here. Its well earned popularity during the long period that it has been upon the market, establishes its superiority over all other saw vises. It is the only saw vise in the market that is so constructed as to spring or strain the saw, preventing vibration and effecting a great saving in files. The vise can be readily attached to a bench, and being small and light, can be conveniently carried about from place to place—in fact, filling a want long felt by saw filers and wood workers generally. Send for Illustrated Catalogue to

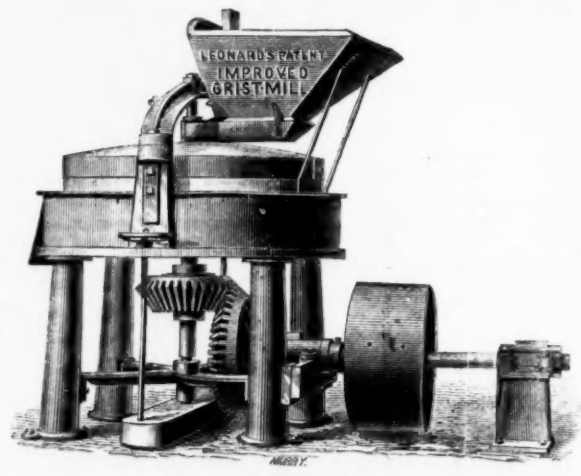
GEO. N. STEARNS & CO.,
Syracuse, N. Y.

Hubbard & Curtiss Mfg. Co.,
New York Agents.

Burr Stone Flouring & Grist Mills,

LEONARD & SILLIMAN, Manufacturers,
BRIDGEPORT, CONN.

Send for Illustrated Catalogue and Price List.



Many & Marshall,

48 Warren St., N. Y.

SASH CHAIN.

THE BEST & CHEAPEST MADE.

Manufacturers of every description of

BUILDERS' HARDWARE,

Pure Bronzed Metal and Hand-Plated Knobs, Hinges, &c.,

Agents for Gautier's Black Lead Crucibles.

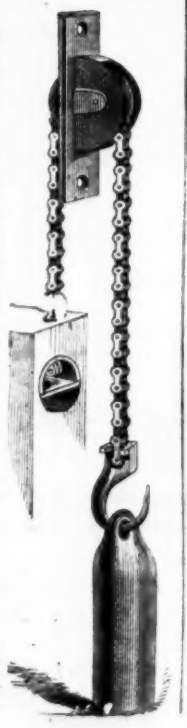
Agency and Depot of the TRENTON LOCK COMPANY.

Chain and Pulley for Heavy Sash

THOMAS MORTON,

Manufacturer of

Brass & Copper Chain,

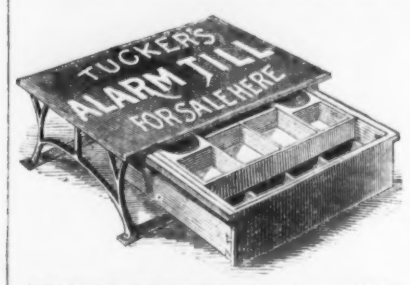


And patented attachments for same, for suspending windows, from 100 to 1500 lbs. Sashes can be suspended with my Chain and attachments in a shorter time and with less trouble than by using the ordinary common cord. I am now offering the Chain and fastenings cheaper than any other in the market. Also manufacturer of the MORTON & BREMNER'S Straight and Circular Spring Balances. Established in 1842.

Office, No. 15 Murray St., N. Y.

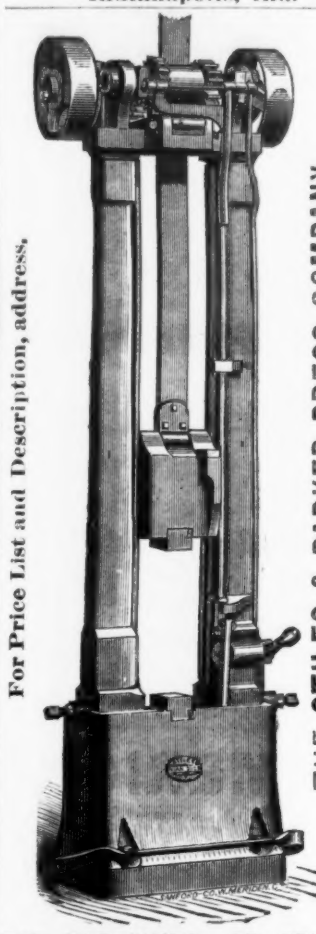
TUCKER'S

Alarm Tills.



Will furnish with first Order above case, gratis, for Sample Room. Send for price list to the Trade.

TUCKER & DORSEY, Manufacturers
Indianapolis, Ind.



For Price List and Description, address,

THE STILES & PARKER PRESS COMPANY,
MIDDLETOWN, CONN.

THE HOTCHKISS, OR FRICTION ROLL DROP,

With N. C. Stiles' Improvements.

Patented Steam and Hydraulic, April 1, 1868

EAGLE PACKING,

Of various sizes for **ENGINES and PUMPS,** manufactured by JAMES GLANDING & CO., No. 115 Queen St., Philadelphia. What the proprietors claim for the Eagle Packing: 1. Its general adaptation to all purposes for which packing is used. 2. Its durability. It will outlast any other article in use. 3. Its cheapness. It can be furnished to the consumer at a lower rate than any other packing.

Schweitzer Mfg. Co.,

57 Reade Street, New York.

CONTINENTAL LOCKS,

Made of Wrought Iron or Brass, very superior in quality, and only an auger used in mortising.

SCHWEITZER PAD LOCKS,
EXCELSIOR COMPASSES.
EXCELSIOR DIVIDERS,
WITH
STUBS' STEEL POINTS,

Best and Cheapest Goods in the market. Sole Agents for the United States for

NEWBOULD'S FILES AND TOOLS
French Coffee Mills.
NOBLE MFG. CO., Tools, Ship Augers &c.
Emery, Waterhouse & Co., Shovels & Spades

We also make a superior
AXE. { *"Queen of the Forest,"* *"Wood Chopper's Pride,"* &c.
Disston's Saws. (Largest Stock in the City).
General dealers in
FOREIGN & DOMESTIC HARDWARE.

James S. Patterson,

Designer & Engraver on Wood.

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Manufacturers of

Wrought Butts, Strap & T Hinges, Wrought Hooks, Hasps & Staples, Wrought Repair Sinks & Washers,

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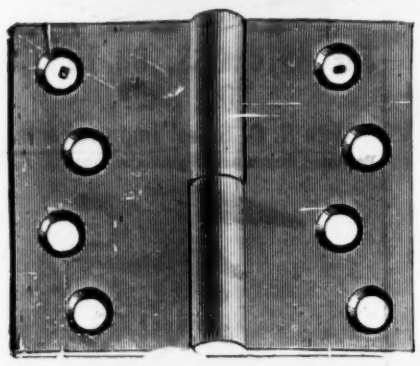
AMERICAN BUTT CO.,

PROVIDENCE, R. I., Manufacturers of

Cast Butt Hinges



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BUILDERS'

HARDWARE.

New York Warehouse with

Messrs. GRAHAM & HAINES,

No. 88 Chambers Street.

Send for Price List.

Al kinds of

SMALL CASTINGS

Made to order.

Headquarters for

Henry Disston & Sons' Saws,

Hand, Mill, Circular and Cross Cut.

ALSO,

Plumbs and Levels, Try Squares, Gauges, Trowels and Barker's Reversible Butt.

A full assortment constantly on hand. Address orders to

GRAHAM & HAINES, 88 Chambers Street, N. Y.

CENTENNIAL

SELF-LUBRICATIVE

Hemp Piston Packing

FOR

Locomotives, Steamships, Stationary Engines, Hot or Cold Water Pumps.

Recommended by Master Mechanics and Engineers, as the cheapest and best in market. **No more Extortionate Prices. No more Fluted Rods**—but a good article at fair price.

JOHN CANFIELD & CO.,

SOLE MANUFACTURERS,

Office, 1321 Fairmount Ave., Phila.

PATENT APPLIED FOR. Send for Circular.

BAEDER, ADAMSON & CO.,

Manufacturers of

Sand and Emery Paper and Emery Cloth

(Also, in Rolls for machine work.)

GROUND EMERY, CORUNDUM AND FLINT,

Glue & Curled Hair, Cow Hide Whips.

STORES:

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NEW YORK, 67 Beekman St.,
BOSTON, 143 Milk St.,
CINCINNATI, 92 Main St.,
CHICAGO, 182 Lake St.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets: Common and Swedes Iron, Leathered, Carpet, Lace and Glimp Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails, &c. Rivets made to Order

NEW YORK AGENCY

Grundy & Kenworthy

HARDWARE.

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Agent for the Philadelphia Star Carriage and Tire Bolts

SAMUEL LORING'S

PLYMOUTH TACK AND RIVET WORKS

PLYMOUTH, MASS., manufacturer of

TACKS, BRADS, NAILS AND RIVETS.

Swedes and Common Iron Tacks; Leathered, Carpet Brush, Lace and Gimp Tacks; Finishing, Hungarian, 2d 2d and 3d Fine, Trunk, Clout, and Cigar Box Nails; Black and Tinned Trunk Nails; Zinc, Iron, Copper and Steel Shoe Nails; Brads and Patent Brads; Glaziers' Points &c. &c., **COPPER, BRASS AND IRON RIVETS**, of all kinds. Coopers' Rivets, from 1d to 6d, in casks of 100 lbs. each. Hose, Belt and Shoe Rivets and Burs. Oval and Countersunk Heads of extra lengths, made to order. SHIP AND BOILER RIVETS OF ALL SIZES AND LENGTHS

Established in 1810.

HOBART'S TACKS.

Manufactured by

Dunbar, Hobart & Whidden,

Office and Salesroom,

116 Chambers Street, N. Y.

Factory, SOUTH ABINGTON, MASS.

Manufacturers of

American, Swedes and Copper Tacks, Tinned Leathered and Large Head Tacks, Finishing Nails, Black and Tinned Trunk Nails, Miners', Gimp, Lace and Brush Tacks, Hungarian, Chair, Cigar Box and Barrel Nails, Glaziers' Points, Iron, Steel, Copper, Zinc and Brass Shoe Nails, **HEEL and TOE PLATES, STEEL SHANKS, and FANCY HEAD NAILS, SILVER or JAPANNED LINING and SADDLE NAILS.**

A full assortment always on hand at salesrooms, for immediate delivery if required.

Odd and irregular sizes made to order or cut from sample at short notice. Send for Price List.

AMERICAN TACK Co

MANUFACTURERS OF

Copper, Swedes, and Iron Tacks,

BRUSH, LACE AND GIMP TACKS,

Leathered, Tinned, and Iron Carpet Tacks; Finishing, Black, and Tinned Trunk Nails Hungarian and Cigar Box Nails;

COPPER and IRON BOAT NAILS

ZINC, COPPER, STEEL, and IRON SHOE NAILS 2d and 3d FINE NAILS;

Bright and Tinned Roofing Nails.

BRADS, PATENT BRADS, &c,

Factory, Fairhaven, Mass.

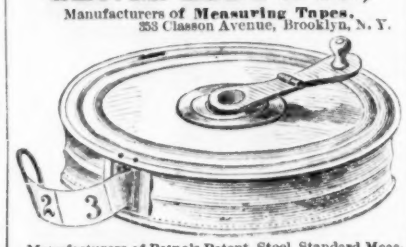
Salesroom, 117 Chambers Street, NEW YORK

N. B.—Any variation from the regular size or shape of the above named goods cut from sample to order.

GEO. M. EDDY & CO.,

Manufacturers of **Measuring Tapes,**

353 Classon Avenue, Brooklyn, N. Y.



Manufacturers of Paine's Patent Steel Standard Measuring Tapes, for Surveyors, Engineers and Mechanics requiring a correct measure of great length according to U. S. Standard. Also of Tape measures for the same trades, Lumbermen, Machinists, Tailors, Shoemakers, Dressmakers, &c. Catalogues on application.

SOUTHERN AGENCY

FOR THE SALE OF

CHESAPEAKE CUT NAILS AND SPIKES.

MALLORY, WHEELER & CO.'S LOCKS, KNOBS, &c.

American Screw Co.'s Screws.

AMERICAN BUTT CO.'S Cast Butt Hinges.

PLYMOUTH TACK CO.'S Tacks and Rivets.

ROBERT MANNS' Axes.

WOOLWORTH'S Axe Handles.

BEST NORWAY NAIL RODS, Newton Brands.

M. Rowland & Co.'s Shovels and Spades.

ALSO, HEADQUARTERS FOR

O. AMES & SON'S SHOVELS AND SPADES.

HENRY DISSTON'S SAWS, HAND, CROSS-CUT, MILL, &c.

SHEBLE & FISHER'S Forks.

HARPER'S Hoes and Rakes.

MOSS & GAMBLE'S Files.

The trade can save both time and freight by ordering from our stock containing a large and full assortment of the above goods, which we offer at **Manufacturers' Prices.** Send for Price List.

KEITH & KELSO,

Hardware Commission Merchants,

Nos. 23 and 25 South Charles St., BALTIMORE, MD.

The Hart, Bliven & Mead Mfg. Co.

18 & 20 Cliff Street, and 243 & 245 Pearl Street, New York.

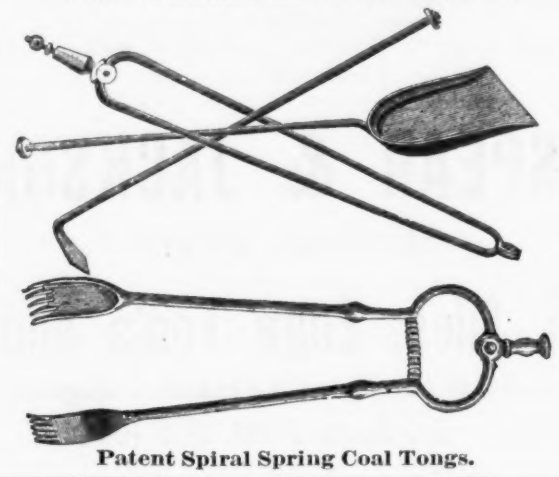
Factories at KENSINGTON, CONN.

MANUFACTURERS OF

Shovels, Tongs and Pokers,

WITH PATENT RIVETED JOINTS.

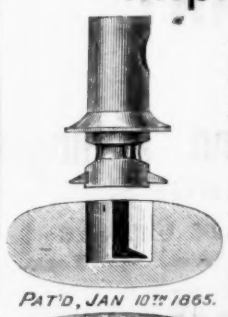
Send for our new Catalogue



and Price List of House Furnishing Hardware.

Patent Spiral Spring Coal Tongs.

Improved Door Knobs.



PAT'D, JAN 10TH 1865.

On the 10th January, 1865, we obtained Letters Patent for improved method of securing necks to Mineral and Porcelain Door Knobs, which improvement was used by us long enough to prove its utility, but on account of unsettled claim of joint ownership by former partner, its use was discontinued. Having now made a further improvement, for which we have made application for a Patent, we are now making the **BEST SECURED** and **MOST DURABLE** Mineral and Porcelain Door Knobs ever offered in this or other markets.

We solicit orders for these Knobs at our regular prices for old styles, with the understanding that if any can be loosened from or gotten off the necks without breaking the tops, they may be held by the purchaser subject to our order, with expenses added.

See *The Iron Age*, of August 21st., page 11, for illustrated description of our patent **Telescope Locks and Latches,** with patent Flat **Steel Perforated Keys,**

Address

BRANFORD LOCK WORKS,

Branford, Conn.

Or, THE HART, BLIVEN & MEAD MANUFACTURING CO., Agents,

18 & 20 Cliff and 243 & 245 Pearl Streets, New York

"Easily Applied and not Liable to get out of Order."—From Report of Judges at American Institute Fair, 1872.

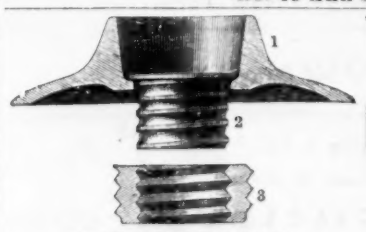
The Challenge Door Spring Co.,

Patented. Exclusive Manufacturers of the [March , 1873

In Appearance the Most Beautiful. In Action the Most Graceful. In Use the Most Reliable.

The Challenge Springs are manufactured from **Steel Wire, tempered by an Improved Process,** the result of repeated experiments, and must not be classed by dealers with the numerous worthless "Coil Springs" made from common Bed Spring Wire.

No. 49 Ann Street, NEW YORK.



PATENT DOOR-KNOB ROSETTE.

No. 1, Rosette.
No. 2, Screw entering No. 3.
No. 3, Stationary bushing remaining firmly in door.

The Wethersfield Novelty Co.

MANUFACTURERS OF

Builders' Hardware and Plated Goods.

BRASS AND IRON FOUNDERS.

Particular attention given to Light Manufacturing for outside parties; also,

BRASS & IRON FOUNDING, SILVER & NICKEL PLATING. Orders Solicited.

We would call the particular attention of the trade to our **PATENT IMPROVED ROSETTE** for Door Knobs. This Rosette does away with the small screws and *cannot* work loose. It can be applied four to one faster than any others. Can be applied to old doors.

Factory on the Valley R. R. at Wethersfield, Conn.

Communication from Hartford (2 miles) by horse or steam cars.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.—Solid Cast Steel....℘ ℔ 14c
Peter Wright's....℘ ℔, gold, 12½c
Wilkinson's....11½c
Eagle....11 cents currency—dis 15 @ 15&5 %
Apple Parers.—Reading Improved....per doz $8 50
Victor, Improved.... " 8 25
Union, " .... " 8 00
Turn Table, " .... " 8 50
Discount for 25 dozen lots.... " 50c
Axes.—Mann's Light....Per doz. $13 00 @ 14 00
Hunt's Light.... " 14 00 @ 14 50
Red Indian, all sizes.... " 12 50 @ 12 00
Red Chieftain, all sizes.... " 12 30 @ 13 00
Crown Prince.... " 13 50 @ 13 00
Augers and Auger Bits.—Pierce's Pat. Twist Bits....dis 25 @ 25&5 %
Bates' & Ives' Bits....dis 30&10 %
Douglass' Bits....dis 30&10 %
Cast Steel Bits....dis 35&10 %
Cook's Bits....dis 40 %
Bonney's Pat. Hollow Augers....dis 25 %
Stearn's Patent Hollow Augers....dis 25 %
Russell Jennings' Bits....dis 10 %
Bates' & Ives' Nut Augers....dis 30&10 %
Douglass' Nut Augers....dis 30&10 %
Watrous' Ship Augers....dis 10 %
Balances.—Landers Frary & Clark's....dis 15 %
Chattillon's....dis 15 %
Morton's....dis 15 %
Common Spring with Hook....℘ doz $1 38 @ 2 00
Bells.—Bevin Bros. Mfg Co. Light Hand Bells....dis 60 @ 60&10 %
Other makers light....dis 60 @ 60&10 %
Swiss Pattern Hand Bells....dis 40 %
Connell's Door Bells....dis 50 %
Great Western and Kentucky Cow....dis 50&10 %
Boring Machines.—Bates' Mfg. Co., complete with augers....dis 15 @ 20 %
Douglas' Mfg. Co., complete with augers..dis 15 @ 20 %
Common Boring Machines, no Augers....$4 25 @ 4 00
Angular, " " .... 5 25 @ 5 00
Bolts.—Eastern Carriage Bolts....dis 70&10 %
Western " " ....dis 70&10 %
Philadelphia " " ....dis 50 %
Wrought Shutter Bolts....dis 45 @ 50 %
Cast " " ....dis 30&10 %
Skelly's Phila. Norway iron, finish. points....dis 50 %
Braces.—Barber's....dis 40 %
Backus....dis 40&10 %
Bartholomew's American Ball....dis 10&10 %
Spoffard....dis 40 %
Butts.—Cast Fast Joint, Narrow....dis 50 %
" " Broad....dis 50 %
Cast Loose Joint....dis 60 %
" Acorn, Loose Pin....dis 40&10 %
Wrought Loose Pin....dis 35 %
" Table Hinges and Back Flaps....dis 30 %
" Narrow....dis 30 %
" Loose Joint....dis 35 %
" Reversible....dis 35 %
Parker's Blind Butts....
Shepard's " " ....
Clark's " " ....
Cherrytree " " for wood.
(dis 50 %—dis by the case 50&5 %)
Lull & Porter's " ....dis 25&10 %
Chains.—German Halter....new gold list dis 10 %
" Coil....new gold list dis 10 %
Galvanized Pump....℘ ℔ 15c
Best Proof Coil Chain—

℘ ℔....	13¼	10¾	10	9¾	9¼	9	8½c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

By the cask, 560 lbs., discount ½c per lb. Common Chain, ½c per lb. less than proof.
Chisels.—Socket Framing....dis 60 @ 60&10 %
Socket Firmer....dis 60 @ 60&10 %
Tang " ....dis 40 @ 40&10 %
Beaty's Framing and Firmer....dis 10 @ 15 %
Casters.—Porcelain Wheel....dis 30&10 %
Iron....dis 70&10 %
Brass....dis 30&10 %
Clothes Wringers.—Universal....per doz $72 00
Novelty.... " 72 00
Reliance.... " 72 00
Providence.... " 72 00
Orders for 5 dozen, discount $3 per dozen.
King Wringers (Iron Frame)....per doz $68 00
Coffee Mills.—Common Box and Side....dis 10 @ 15 %
Patent Box and Side....dis 10 @ 15 %
Cutlery.—American Pocket (best)....dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices.
Drawing Knives.—Hart Mfg. Co.'s ..dis 60 @ 60&10 %
Concave Adjustable Handle....dis 10 %
Beatty....dis 10 @ 15 %
Fry Pans.
Tinned....dis 20 %

℘ doz..	$3 00	3 25	3 62	4 00	4 50	5 00	5 50	6 00	7 50
No....	0	1	2	3	4	5	6	7	8

Burnished....

℘ doz..	$2 80	3 00	3 38	3 75	4 12	4 50	5 00	5 62	6 75
No....	0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files....new list, $5 00 to £ cur dis 10 %
" Bastard.... " 5 00 to £ cur dis 10 %
" Taper.... " 5 00 to £ cur dis 10 %
Butcher's Mill....$5 75 to £ gold
" Bastard.... 5 50 to £ gold
Taper.... 5 50 to £ gold
Moss & Gamble—Mill, Taper and Bastard....5 50 @ 5 25 to £ gold
Fluting Machines.
K. F. M.—4½ in. rolls, $5 50....dis 10 %
" —6 in. rolls, $6 65....dis 10 %
Mrs Knox—4 in. rolls, $5 50....dis 10 %
" —6 in. rolls, 6 65....dis 10 %
Hammers.
Yerkes & Plumb's....dis 10 %
Hammond & Son's....dis 10 %
Veree....dis 10 %
Hatchets.
Beatty's....dis 10 @ 15 %

Shingling and Half.	℘ doz...$7 00	7 50	7 75	8 00
	No.... 1	2	3	

Yerkes & Plumb....dis 10 %

Shingling and Half.	℘ doz...$7 00	7 50	8 00	8 50
	No.... 1	2	3	4

Claw....	℘ doz....$7 50	8 00	
	No.... 1	2	3

Hinges.—Strap and T, advanced Feb. 6....dis 25&7½ %
Bonney's No. 1 Gate....dis 25 %
" No. 2 and 3....dis 35 %

Horse Nails.	Nos. 6	7	8	9	10
Ausable....	27	25	24	23	22
Globe....	28	26	25	24	23
Brundage....	26	24	23	22	21
Nos. 5	6	7	8	9	10
Putnam.... 32	28	26	25	24	22

On Ausable, Globe and Brundage 1000 ℔ lots....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination....new list dis 45 %
Extra discount for cash 2 %
Mineral and Rim....dis 45 %
Locks and Latches.—Rim and Mortise....dis 45 %
Extra discount for cash 2 %
Till and Cupboard....dis 25 %
American Padlocks....dis 50 %
Scandinavian Pad Locks.

℘ doz....	$10 50	10 50	12 00	12 00	15 00	15 00	dis 15 %
No....	9	9½	10	10½	11	11½	
℘ doz....	$18 00	18 00	22 00	22 00			dis 15 %
No....	12	12½	13	13½			

Trunk Locks....dis 5 @ 10 %
Thumb and Roggens Latches....dis 25 %
Lanterns.—Square Candle and Oil....dis 10 %
Globe for Oil....dis 10 %
" " Kerosene....dis 10 %
Tubular Lanterns....dis 10 %
Mattocks.—Long and Short Cutter....dis 25 %
Western Pattern....dis 25 %
Pennsylvania Pattern....dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets....dis 20 %
Stebbins' Gates....dis 60 @ 60&10 %
Lincoln's " ....dis 40 @ 40&10 %
Landers, Frary & Clark's Petroleum...dis 10 @ 10&10 %
Taylor's Petroleum Faucets....dis 20 @ 20&10 %
Brass Liquor Cocks....dis 20&10 %
Meat Cutters.—Dixon's....dis 10 %
Woodruff....dis 10 %
Stowe....dis 10 %
Hale's....dis 25 %
Stuffers....dis 10 %
Planes.—Auburn Tool Co., "Bench"....dis 30&5 %
Second Quality....dis 40 %
Metallic Plane Co....dis 25&5 %
Evans Pat. Circular....net
Plane Irons.—American....list net
Butcher's....gold £, $5 50
Picks.—Philadelphia....net
Pittsburgh....net
Plumbs and Levels.
Stanley Rule and Level Co....dis 60 @ 60&10 %
Wm. Johnson, (Stanley List)....dis 60 @ 60&10 %
Rakes.—Cast Steel Garden....dis 33⅓ %
Malleable Garden....dis 33⅓ %
Wood Head Iron Teeth....dis 30 @ 40 %
Rules.—Stanley Rule and Level Co....dis 60 @ 60&10 %
Steven's and Hubbard's....dis 60 @ 60&10 %
Steelyards.—American Pattern....dis 15 %

℘ doz....	$5 50	7 00	9 00	10 00	11 00	12 00
No....	50	100	150	200	250	300

English Pattern....dis 15 %

℘ doz....	$7 00	8 67	10 67	12 67	14 67	16 67
No....	50	100	150	200	250	300

L. F. & C. Excelsior....dis 10 %

℘ doz....	$9 00	10 00	12 00	15 00	18 00	21 00
No....	50	100	150	200	250	300

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened....℘ doz. $11 00 net
Clipper No. 10, Boxed and Sharpened....℘ doz $10 50
" " 5, " " .... " 10 00
Common Scythes....℘ doz $7 00 @ 10 00
Squares.—Steel and Iron, new list....dis 50 %
Saws.—Disston's Cross Cut....dis 12½ %
Disston's Hand....dis 12½ %
W. McNiece's H'd, Cross-Cut & Circ'r, new list..dis 15 %
Boynton's Lightning, new list....dis 30 %
Shovels and Spades.
Rowland's Plain Back, list Feb. 1873....dis 20&10 %
" Back Strap " ....dis 20&10 %
Oliver Ames & Sons....new list dis 12½ %
Brady Shovel Co....dis 12½&5 %
Sad Irons.—Richmond (polished face)..per lb. 4¾c. net
Coquanock (polished face).... " 4½c. net
Stone.—Arkansas Oil, No. 1....℘ ℔ $1 38
Turkey Oil, No. 1.... " 1 00
Washita Extra.... " 30c
" No. 1.... " 22c
" " 2.... " 18c
Hindostan 8 in.... " 5½c
" Axe.... " 7c
Screws.—Iron....new list, Jan. 1st, 1874, dis 52½ %
Brass....dis 52½ %

Spoons.—
Plated Spoons, Rogers Bros.'...new list dis 30 @ 30&5 %
Britannia Spoons....dis 40 @ 40&5 %
German Silver....new list dis 10 @ 15 %
" Light....new list dis 15&5 %
Lalance & Grosjean Iron....dis 10 %
Springs.—Gray's Door....dis 40 %
Torry's Door....dis 40 %
Stocks and Dies....dis 15 %
Stove Polish.—Gem....℘ gross, $5 00
Onyx.... " $5 00
Try Squares.—Winterbottom....dis 10 @ 15 %
Stanley Rule and Level Co....dis 45&10 %
Willis Thrall, No. 2....dis 30&10 %
Disston's No. 2....dis 40 %
Tacks, &c.—Half Weight Tacks....dis 70 %
" by the case....dis 70&7½ %
Clout and Finishing Nails....7½ %
" " " by the case....dis 7½ %
Traps.—Genuine Oneida—Newhouse list....dis 20 %
Imitation " " " ....dis 30 %
Vises.—Solid Box....℘ ℔ net 15c
Wrenches.—Coes Genuine....dis 40 %
Coes Imitation Wrought Bar....dis 50 %
" " Malleable Bar....dis 60 %
" " (Kellogg) Malleable Bar....dis 50 @ 10 %
Tafts Pattern (Wrought Bar)....65 %
" " Kellogg's (Nail Bar)....dis 65&10 %
Philadelphia Tool Co.'s Pat. Duplex....dis 25 %
" " " Improved Baxter....dis 25 %
" " " Adjustable Fork....dis 25 %
Wire.—No. 0 to 18....dis 37½ @ 40 %
No. 19 to 26....dis 40 @ 42½ %
No. 27 to 36....dis 45 @ 47½ %
Coppered 0 to 12....dis 15 @ 20 %
Tinned Broom Wire....dis 20 %
Galvanized Wire No. 0 to 18....dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

April 11, 1874.

Augers—C. S. Cut, French, Swift & Co....dis 30&10 %
Bits, Auger—Pierce's....dis 30 %
Snell Mfg. Co....dis 20 %
Jennings....dis 10 %
Bells, Cow—Yaw's Genuine....dis 35 %
Bolts—Carriage and Tire....dis 75 %
Braces—Bit, Spofford's Patent....dis 40 %
Brads, Cut....dis 50&7½ %
Boards—Stove, Brooks' Patent....dis 30 %
Butts—Brass....dis 25 %
Cast Loose Joint....dis 60 %
" " Pin....dis 45 %
" " " Japanned....dis 45 %
" " " Silver Tipped....dis 25 %
Wrought Narrow....dis 30 %
" Broad, Loose Joint....dis 35 %
" Table and Back Flaps....dis 30 %
Wrought Butts, Loose Pin....dis 35 %
Belting—Rubber....dis 30 @ 30&5 %
Leather new list....dis 30 @ 30&5 %
Beaters, Egg, "Peerless"....per doz $4 00
Brick—Bath (box of 2 doz) Best English....$1 50
"Rutherford"....$1 00
Chalk—White, Carpenter's....℘ gross, 50c
Red, Carpenter's.... " 75c
Blue, " .... " 90c
Chisels—Firmer Socket....dis 60&10 %
Framing Socket....dis 60&10 %
Corner Socket Chisels....dis 60&10 %
Slick's Carpenters'....dis 60&10 %
Castings—Malleable....℘ ℔ 10½c
Cherry Seeders....per doz $12 00

Elbows—Corrugated....	5	5½	6	7	
Charcoal....	$4 25	5 25	5 25	6 50	dis 10 %
Russia....	10 00	13 00	13 00	14 00	

Files—Maischoss Bros....dis 50 %
Freezers, Ice Cream—"Champion"....dis 33⅓ %
Hinges—Window Blind—
Clark's No. 20....55&10 %
Shepard's Standard, and Clark's....dis 50 %
Wrought Strap and T....dis 55&7½ %
Hods, Coal—Plain, Black and Galvanized....dis 10 %
Funnel, Black and Galvanized....dis 10 %
Fancy and Helmet....dis 10 %
Palace Coal Vases....net
Hooks and Staples—Wrought....dis 60&10 %
Hooks—Belt....dis 50 %
Hasps and Staples—Wrought....dis 60&10 %
Sad Irons....4½c
Kettles—Brass....℘ ℔ 50 @ 55c
Enameled....dis 45 %
Knives, Drawing—Oval No. 1....dis 60&10 %
Razor Blade....dis 50&10 %
Lanterns "Peerless,"....No. 1 5 10
℘ doz $26 00 $11 25 $13 75 dis 10 %
Gem, with guards....$6 50
Tubular....11 50
" with Guards....12 00
Machines—Apple Paring, "Turn Table"....8 50 ℘ doz
Mills, Coffee—Box and Slide, common....dis 10 %
Box Union and Eagle....dis 10 %
"American"....dis 20 %
Nails—Clout and Finishing....dis 7½ %
Shoe....dis 7½ %

Horse, Ausable....No.	5	6	7	8	9	10
	30	27	25	24	23	22c

" " Finished & Pointed....add 1c ℘ ℔
" " 1000 lbs....dis 5 %

" Clinton....No.	6	7	8	9	10
	22	20	19	18	17c

Packing—Rubber....dis 30 @ 30&5 %
Pencils, Slate—Soapstone....4 5 6in.
30 40 50c. ℘ 100
Case lots....dis 20 %
Paint—White Lead, U. S. Gov't....℘ ℔ 9 c
Rivets—Iron, Black and Tinned....dis 20 @ 25 %
Copper....dis 10 %
Rope—Manila, ½ inch and larger....℘ ℔ 16½c
Rules—Boxwood and Ivory, Stephens....dis 60 %
Screws—"American Screw Co"—
Flat Head, Iron....dis 52½ %
Flat Head, Brass....dis 52½ %
Staples—Blind, Boardman's Pat., ½ & ⅝....℘ ℔ 37c
Spoons, Iron Tinned....dis 10 %
" by the case....dis 20 %
Plated Rogers' A No. 1....dis 30&5 %
Britannia....dis 40 %
Squares—Steel and Iron....new list 50 %
Shoes, Horse—H. Burden & Sons....℘ keg $6 00
Shovels & Spades—Shepard, Forsyth & Dennison..dis 20 %
Saws—Henry Disston & Sons....dis 10 %
Scales—Buffalo Scale Works....dis 25 %
Fairbanks....dis 15 %
Shears—Seymour's....dis 60 %
Traps, Steel—Newhouse....dis 20 %
Tacks—Half Weight Am. Iron....dis 70&7½ %
Vises—Parallel, Buffalo....dis 20 %
Wrenches—Coes' genuine....dis 40 %
Coes' Imitation....dis 50&10 %
Tafts' Pattern....dis 65&10 %
Ware—French, Tinned and Iron....dis 30
Stamped and Japanned....net
Cast Iron Hollow....dis 30 %
Tin Plates.—Add for each X....2 50

10x14, IC. Charcoal...	$12 50	14x20 C. terne...	11 50 @ 11 75
12x12, " ...	13 00	20x28 C. " ...	25 00
12½x17, " ...	12 00	20x28 X. " ...	29 25
14x20, " ...	13 50		

Pig Tin—Straits....33c @ 34c
Bar Tin....35c
Solder....No. 1, 19c; No. 2, 17c
Sheet Zinc—
"Lasalle"....570 100 ℔ casks
$10 00 10 30 ℘ 100 ℔s
Sheets....$10 00
Iron Wire—Bright and Annealed....dis 35 %
Coppered....dis 30 %
Tinned....dis 15 %

Tinned Broom,	Nos. 20	21	22	....dis 20 %
	20c	21c	21c	

Copper—Sheathing 14 @ 18 oz....℘ ℔ 33c
Planished....℘ ℔ 39 @ 41c
Bottoms....℘ ℔ 35c
Bolts....℘ ℔ 35c
Braziers' Sheets....℘ ℔ 35c
Sheet Iron.—
18 Common....$5 10
24 Common....5 30
24 W. D. Wood & Co., Smooth Finish....6 10
Am. Russia....A. 14½c B. 11c
Gen. Russia, No. 1 stained....20c
" " clean....21c
Galvanized....dis 15 %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.

Tin Plate.—I. C. 10x14 Charcoal....$12 00 @ 14 00
I. X. 10x14 Charcoal....15 50 @ 17 00
I. C. Terne 14x20....11 00 @ 12 50
I. C. Terne 20x28....24 00 @ 25 50
I. C. Continuous....28 00
Block Tin.—Pigs....37½c @ 38c | Bars....℘ ℔ 39c
Solder.—S. & Co....℘ ℔ 28c | A 1....℘ ℔ 24c | Roofing.... " 23c
Lead.—Pig..℘ ℔ 7½c @ 8c. | Bar....℘ ℔ 8c @ 9c
Copper.—
Ingot....℘ ℔ — | Sheets, 6 to 9 lb...℘ ℔ 41c
Planished.... " @ 40c | " 10 to 12 lb.... " 38c
Sheathing.. " @ 35c | Braziers 13 lb.... " 35c
Copper Drops 37c @ 38c | Copper Bottoms.... " —
Zinc. Cask, 500 to 1000 lbs....℘ ℔ 11 c
Case, 100 lbs.... " 11½c
Slab.... " 8½c @ 9c
Brass.—
Roll, No. 6 to 30. ℘ ℔ 45c | Roll, No. 38 to 40...℘ ℔ 50c
" 30 to 38. " 65c | Wire, No. 0 to 20...℘ ℔ 50c
" 20 to 25... " 60c
Babbit Metal.—Sellew & Co....℘ ℔ 35c | Black Lead....℘ ℔ 25c | Market.... " 15c
Antimony....℘ ℔ 20c
Bismuth....℘ ℔ $6 00
Nickel....℘ ℔ $3 50

Sheet Iron.—
Russia....℘ ℔ 20c @ 22c | Am Russia A..℘ ℔ 14 @ 15c
" " B.. " 13 @ 14c

	Com. B.	Smooth Fin. S. L. U.	Smooth D Re'fd.
15 to 20....	6 0c	7 5c	9 0c
22 to 24....	6 2c	7 7c	9 2c
26....	6 4c	8 0c	9 4c
27....	6 6c	8 2c	9 6c

Galvanized Iron.—Full bundles....dis 25 %
Nos. 18 to 20....15c | No. 27....18c
22 to 24....16c | 28....20c
25 to 26....17c
Bar Steel.—Silver, ℘ ℔ 21c; Crescent, 17½c.
Iron Wire....dis 25 %
Enameled Ware....dis 33⅓ %
One Piece Corrugated Elbows....dis 10 %
Iron Gas Pipe....dis 65 %

Charcoal Iron.		Russia Iron.	
4½ inch....℘ doz	$3 75	4½ inch....℘ doz	$8 00
5 " .... "	4 25	5 " .... "	10 00
5½ " .... "	5 25	5½ " .... "	13 00
6 " .... "	5 25	6 " .... "	13 00
" .... "	6 50	7 " .... "	14 00

Leader Elbows—Flat Crimp Retinned.—

℘ doz.		℘ doz	
2-inch....	$2 00	2½-inch....	$2 25
3-inch....	2 50	3½-inch....	3 00
4-inch....	3 50	4½-inch....	4 00

Sheet Iron Bread Pans....℘ ℔ 12c
American Broilers....℘ doz, $13 50
Tinmen's Machines....net list
Sad Irons....℘ ℔, 5¼c
Brass Kettles.—Ansonia....48c

PITTSBURGH.

Card Rates, 60 days.

Flat Bar.—
1½ to 4 x ⅜ to 1 inch..3 8c | 1¼ & 1⅜ x ⅜ to ¾ in....3 5c
4½ to 6 x ⅜ to 1 inch..3 5c | 1 & 1⅛ x ⅜ to ¾ in....3 6c
1⅛ to 6 x 1⅛ to 1½ in..3 7c | ⅝, ¾ & ⅞ x ⅜ to ⅝ in..3 7c
Horse Shoes.—All sizes....4 8c | Nail rods....7 2c
Heavy Bands.—
3½ to 6 x ¼ & 5-16 in..3 9c | ⅞ to 1⅛ x ¼ & 5-16 in....4 3c
1½ to 3½ x ¼ & 5-16 in..4 0c | ½ to ¾ x ¼ & 5-16 in....4 5c
Light Bands.—
3 to 6 x 3-16 to No. 12..4 3c | 1 to 1⅛ x 3-16 to No. 12..5 9c
1½ to 2¾ x 3-16 to No. 12....4 5c | ⅝ to ⅞ x 3-16 to No. 12..5 5c
Hoops.—2¼ to 3 in....4 6c | 1 in....5 9c
3⅛ to 4⅜ in....4 8c | ⅞ in....6 3c
1⅞ to 2 in....4 8c | ¾ in....6 5c
1⅜ to 1 11-16 in....5 1c | ⅝ in....7 5c
1⅛ & 1¼ in....5 4c | ½ in....7 5c
Round and Square.—
1 to 1⅞ in....3 3c | ½ to 7-16....4 0c
2 to 2⅜ in....3 6c | ⅜ in....4 1c
3 to 3⅞ in....3 8c | 5-16 in....4 5c
3¾ to 4 in....4 3c | ¼ in....5 9c
⅝ to 9-16 in....3 7c | 3-16 in....6 9c
Oval Iron.—
⅞ to 1¼ in....3 9c | ½ in....4 3c
⅝ to ¾ in....4 1c | ⅜ in....4 9c
Half Oval and Half Round.—
⅞ to 1¼ in....4 2c | ½ in....5 4c
⅝ to ¾ in....4 7c | ⅜ in....6 9c

	Boiled.	Charcoal.	Jun.
Sheet Iron, 10 to 14....	5 3	6 8	8 3
" 15 to 20....	5 5	7 0	8 5
" 21 to 24....	5 7	7 2	8 7
" 25 to 26....	5 9	7 4	8 9
" 27....	6 1	7 6	9 1

All sheets over 28 in. wide, ½c. ℘ ℔ extra.
Tank Iron—
3-16, ¼ & ⅜ in. thick..5 3c | Heads flanging....9 0c
Boiler Plate Iron....8 0c | Plow Slabs....5 9c
Heads not flanging....6 2c | Plow Wings....6 4c
Railroad Iron—Countersunk and Punched.—
1½ x ⅜, 7-16 & ½ in...4 3c | 1½, 1¾ & 2 x ½ & ⅜ in..3 8c
1¼ x ¼ & 5-16 in....3 3c | 1½ x ⅜ in....4 0c
Extras for Cutting to Length.—
Flat bars and rounds and squares....0 1c | Light bands and wagon box iron....0 2c
Flat bars for tire....0 1c | Hoops....0 3c

The following are the Card rates of Lewis, Oliver & Phillips:

Iron, standard list, assorted sizes, for large orders, 2c. card rate, 2 % off net.
Flat Rail (1¼x¼), punched and coun'sunk..4 7c ℘ ℔ net
Iron Wedges....4½c ℘ ℔ net
Norway Nail Rods....9½c ℘ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point)....5½c ℘ ℔ net
Beetle Rings....9¼c ℘ ℔ net
Fence Pickets—
⅝ round, bent to shape 30c ℘ ft. of fence, less 15 % off net.
Discount off Standard List.
Carriage and Tire Bolts (new list)....70&5 % off net
Plow Bolts....30&10 % off net
Stove Bolts....10 % off net
Machine and Square Head Bolts....30&5 % off net
Coach and Lag Screws....30&5 % off net
Bolt Ends....30 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅝ in....7 c ℘ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in....5½c ℘ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅝ in....8 c ℘ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1⅜ in....6 c ℘ ℔ off net
Nuts and Washers in 25 lb. boxes, 1c ℘ ℔ ex. Nuts and Washers in lots less than one keg each size, 1c ℘ ℔ ex. Nuts and Washers in 5 lb. boxes, 1½c. ℘ ℔ ex.
Harrow Teeth, in lots of 1 ton or more, packed in casks, 1 in. diam. 3½c ℘ ℔ net; ⅞, ¾ in. diam. 3¾c ℘ ℔ net; ⅝ in. diam. 4½c ℘ ℔ net.
Patent Headed Harrow Teeth, packed in casks, ½c ℘ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 6c ℘ ℔ net; 9-16 in. diam. 7c ℘ ℔ net; ½ in. diam. 8c ℘ ℔ net. 1c ℘ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinges, ⅞ to 1 in. diam. 9c ℘ ℔ net; ⅝ in. diam. 10c ℘ ℔ net; ½ in. diam. 12 c ℘ ℔ net.
Screw and Strap Hinges, in lots of 100 pairs or more, 14 to 36 in. long, 5½c ℘ ℔ net; 8, 10 & 12 in. long, 7c ℘ ℔ net.
Strap and T Hinges, 25 & 7½ % off net, delivery as customary.
Screw Hitching Rings....$5 50 ℘ 100 net
Duck Nest Tuyere Irons....$15 00 ℘ doz net
Cast Iron Washers....℘ ℔ 4½c net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long....℘ ℔ 4¼c net
1 to 2 in. diam. from 4 to 8 ft. long.... " 4½c net
1 to 2 in. diam. from 1½ to 4 ft. long.... " 5c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long.... " 5¼c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long " 5¾c net

WAGON HARDWARE.

Wagon Box Strap Bolts—

10 in. long by	7-16 at Screw End, ℘ set of	8	bolts..	55c
12 "	½ "	8	" ..	70c
10 "	9-16 "	8	" ..	90c
12 "	9-16 "	8	" ..	90c
14 "	9-16 "	8	" ..	$1 00
10 "	⅝ "	8	" ..	1 00
12 "	⅝ "	8	" ..	1 00
14 "	⅝ "	8	" ..	1 10
16 "	⅝ "	8	" ..	1 20

5c ℘ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each....18c
" " wide track, each....20c
Single Tree Irons, ℘ set of four pieces....38c
Wrought Iron Bolster Plates, 2¾ in. wide, ℘ set....60c
" " " 3 " " 65c
" " " 3¼ " " 70c
" " " 3½ " " 75c
Wagon Brake Ratchets, each....16½c
" " " finished with guard, each..45 c
Wrought Hammer Straps, heavy pattern, each....16 c
" " " light " each....13½c
" Rub Irons, each....11 c
Stay Chain Hooks, each....8 c
Double and Single Tree Clips, figure 1, each....9 c
" " " " 2, each....10 c
" " " " 3, each....12 c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 100 sets....dis 25 %
Wagon Box Staples, 1½ to 2½ in. to clinch. ℘ 1000 $12 00 net
" " Box Iron, to rivet on. ℘ 1000 8 00 net
Neck Yoke Eyes, each....5c net
" " with ⅜ rings, each....7½c net
King Bolts, ⅞, 1, 1⅛, and 1¼ in. diam....℘ ℔ 4½c net
Wagon Rivets, ex. large, flat, oval and steeple head, ⅜ in. diam. all lengths.... " 9 c net
Wagon Rivets, 3-16 in. diam., all lengths.... " 11 c net
" & Nails, in 5 ℔ paper boxes....℘ ℔ 1c extra
" " in 25 ℔ wood " .... " ½c extra
Wagon and Hinge Nails, ¼ in....℘ ℔ 17 c net
" " " 3-16 in.... " 19 c net
Double Tree Plates....
Coupling " ....
Tongue " .... " 9 c net
Neck Yoke Plates.... " 12 c net
Tongue Cap Iron, 1¾, 2 & 2¼ in. wide, same price ℘ ℔ as Band Iron.
Wagon Chains, Stay Lock and Tongue, 5-16 in. ℘ ℔ 11 c net ¼ in., 12 c. net

DETROIT.

(Reported by Messrs. Jewett & Root.)

Tin Plate.—Best Charcoal
IC, 10x14....$13 00
IX, 10x14....15 75
XX, 10x14....18 50
IC, 12x12....13 50
IX, 12x12....16 25
IC, 14x20....14 00
IX, 14x20....16 75
XX, 14x20....19 50
XXX, 14x20....22 25
XXXX, 14x20....25 00
DC, 100 Plate....12 50
DX, " 15 25
DXX, " 18 00
DXXX " 20 75
DXXXX 100 Plate..23 50
IX, 14x14....25 00
IC, 10x14 W....12 50
IX, 10x14 W....15 25
Roofing Tin.—Best Char.
IC, Terne, 14x20....$12 25
IX, " 14x20....15 00
IC, Terne, 20x28....26 00
IX, " 20x28....30 50
Coke Tin.—
IC, 10x14 Coke....$11 00
IX, 10x14, Coke....13 75
IC, 14x20, " 12 00
Copper.—
Sheathing....33c
Copper Bottoms....36c
Planished Copper.—
Sheathing, 14x48....41c
Boiler Size, No. 7....43c
" " No. 8....43c
" " No. 9....43c
Pig Tin.—Large Pigs..35c
Small Pigs....36c
Bars....37c
Solder.—No. 1....18c
No. 2....20c
Bright Wire.....dis 35 %
Sheet Iron.—
No. 18 Am. Com....5 30
No. 24 Am. Com....5 50
Pat. Am. Russia "A," Nos. 24, 25 & 26.... c
Pat. Planished Russia.. c
Russia No. 9, 10, 11&12... c
W. D. WOOD'S & CO.'S SHEET IRON.—
Nos. 15 to 20 Smooth $6 10
" 21 to 24....6 30
" 25 & 26....6 50
" 21 to 24 Char'l..7 80
" 25 & 26 " ..8 00
Sheet Zinc.—Any width....10 c

Steel.

THREE 1st CLASS PRIZE MEDALS. CLASSES 1, 21, 22, Great Exhibition of Industry, LONDON, 1851.

MEDAL OF HONOUR, SOCIETY OF ARTS & INDUSTRY, LONDON, 1856.

1st CLASS PRIZE MEDAL, CLASS 1ª UNIVERSAL EXHIBITION OF INDUSTRY PARIS, 1855.

LOCKER BROTHERS,

SUCCESSORS TO

SAML. COCKER & SON,

(Established 1752.)

SHEFFIELD, ENGLAND

MANUFACTURERS OF

CAST, [illegible], SHEET, AND BLISTER STEEL, OF EVERY DESCRIPTION.
BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES;
Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

BEST CAST STEEL FILES, SAWS, EDGE TOOLS,
HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS,
FISH HOOKS, NEEDLES. &c.

ALSO

GENERAL MERCHANTS.

Agent, JONATHAN HATTERSLEY, Cincinnati, O.

WM. JESSOP & SONS,

MANUFACTURERS OF

STEEL,

AND IMPORTERS OF IRON

SHEFFIELD, ENGLAND.

PRINCIPAL DEPOTS:

NEW YORK, Nos. 91 and 93 John Street.....BOSTON, No. 141 Federal.
ST. LOUIS, No. 714 North Second Street.

AGENCIES:

PHILADELPHIA, Jas. C. Hand & Co.....PROVIDENCE, Nightingale & Kilton.
CHICAGO, Crerar, Adams & Co.....NEW ORLEANS, Folger & Co.
CINCINNATI, Augustus Wessel.....SAN FRANCISCO, Huntington, Hopkins & Co.

F. W. MOSS,

Successor to **JOSHUA MOSS & GAMBLE BROS.**

FRANKLIN WORKS, WADSLEY BRIDGE WORKS, WALKLEY WORKS, } SHEFFIELD, ENGLAND.

MANUFACTURER AND IMPORTER OF

STEEL AND FILES.

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MOSS & GAMBLE **SUPERIOR C. S.** "FULL WEIGHT" **FILES,**

Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.

WARRANTED CAST STEEL, especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES and all kinds of MACHINISTS' TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools, warranted not to crack in hardening Taps of any size.
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
English Spring and Plow Plate Steel. Also, manufacturer of

Steel Cast Steel, Shear, German, Round Machinery, Hammer, Fork and Shovel Steel

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MANUFACTURERS OF

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AND GENERAL MERCHANTS,

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BARROW HÆMATITE STEEL COMPANY,

LIMITED.

BARROW IN FURNESS,
LANCASHIRE, ENGLAND.

MANUFACTURERS OF

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Steel Rails, Tyres, Wheels,

Axles, Shafting, Boiler & Ship Plates, Bessemer Pig Iron, etc., etc.

CHAS. CONGREVE & SON,

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MANUFACTURERS OF SUPERIOR

STEEL

For Tools, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for SPRINGS AND STAMPING COLD;

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DOG BRAND FILES,

Unsurpassed, if equaled in quality.

Bailey Lane Works, Sheffield, England.
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Established 1810. **HENRY MOORE, Attorney.**

Steel.

SANDERSON BROTHERS & COMPANY,

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MANUFACTURERS OF THE

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Warranted Most Superior for Tools and Granite Rock Drills.

DARNALL WORKS,
ATTERCLIFFE FORGE,
WEST STREET WORKS, } SHEFFIELD, ENGLAND.

IMPORTERS OF FILES,

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AGENTS FOR ARMITAGE'S GENUINE MOUSEHOLE ANVILS.

NEW YORK, Edward Frith, 16 Cliff.
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CLEVELAND, O., Cleveland, Brown & Co.
NEW ORLEANS, Rich'd Rhodes, 71 Camp.
BALTIMORE, Md., Wm. H. Cole.
MONTREAL, Saint Paul St.
NEW HAVEN, Ct., Atwater, Wheeler & Co.

FRANCIS HOBSON & SON,

97 John Street, NEW YORK,

Sole Manufact'rs of **"CHOICE"** Extra Cast Steel.

Manufacturers of all Descriptions of Steel.
Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

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S. & C. WARDLOW,

MANUFACTURERS OF THE CELEBRATED

Cast and Double Shear STEEL,

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.

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Office of S. & C. WARDLOW, 13 Gold Street, New York.

In calling the attention of consumers of Steel in any of the parishes above enumerated, we would respectfully assure them of our ability to supply an article, that cannot be excelled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class Material in quality, temper, and durability, is needed

---

G. SANDERSON & CO.,

Manufacturers of all descriptions of

STEEL.

Bailey Street and Broad Lane Steel Works, } SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.

ALSO STEEL of superior quality for **Turning Tools, Taps, Dies, Drills, &c.**
Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.

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MERCHANT BARS, TIRE AND SHAFTING,

Railroad Iron, Pig Iron, Merchant and Ship Iron,

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Hammered and Rolled STEEL of every description

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Sheffield Steel Works.

(Established in 1848.)

SINGER, NIMICK & CO.

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Manufacturers of **Extra Quality Tool**

CAST STEEL,

Patent Rolled

SAW PLATES,

All descriptions of **Cast and German**

Spring and Plow Steel,

Elliptic and Side Springs, Seat Springs,

AXLES, STEEL TIRE,

Plow Wings, Shares, Cultivators,

Reaper Bars, [illegible]ow Bars, &c., &c.

Warehouse, 83 Water and 100 First Streets.

ISAAC JENKS & SONS,

Minerva & Beaver Iron & Steel Works

Wolverhampton, England,

MANUFACTURERS OF

"Jenks" Spring Steel, Cast and Swedes Spring Steel,

TIRE, TOE CORK, SLEIGH SHOE, BLISTER & PLOW STEEL.

Also, Plow and other Iron.

VAN WART & McCOY, Agents,

43 Chambers St., New York.

A full assortment of "Jenks" Spring Steel in stock.

MILLER, BARR & PARKIN,

Crescent Steel Works,

PITTSBURGH, PA.,

Manufacturers of all descriptions of

STEEL

EQUAL TO ANY IN THE MARKET.

Office.....339 Liberty St.,

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Gunpowder.

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DUPONT'S GUNPOWDER MILLS

ESTABLISHED IN 1801,

Have maintained their great reputation for years. Manufacture the

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LAFLIN & RAND POWDER CO.,

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The superiority is well known of our brands Rifle Powder

Orange Rifle, Orange Ducking, Lightning, Audubon.

SAFETY-FUSE at wholesale.

CHICAGO.

(Reported by Markley, Alling & Co.)

Agricultural Implements.—
Scythes—Dunn Edge Tool Co .....dis 30 %
Hay and Manure Forks—Otsego extra C. S. .....dis 30 %
Hoes and Garden Rakes—Jackson and Otsego...dis 30 %
Scythe Stones.....dis 25 %
Scythe and Bush Snathes.....dis 25 %
Harvest Rakes and Barley Forks.....dis 25 %
Revolving Horse Rakes.....dis 25 %
Handles—Fork and Shovel.....dis 25 %
Cradles—Nithington, Cooley & Co.....dis 25 %
—Genuine Morgan .....₩ doz net $84 00

Augers and Bits.—
Ives' extra C. S....dis 30 % | Snell's.....dis 10 %
Jennings' .....dis 5 % | " Car Bits.....dis 10 %
Cook's.....dis 30 %

Axes.—Amoskeag Yankee.....₩ doz $13 50
Amoskeag Crescent ..... " 14 00
Hunt's Yankee..... " 14 00
Kennebeck Yankee..... " 12 00
Lippincott " ..... " 13 00
" Crown..... " 14 00
" Beveled..... " 14 50
Jefford's Silver Steel..... " 13 00
Red Warrior, Beveled..... " 14 00
Kennebeck, Handled..... " 15 00
Boy's, Handled..... " 12 00

Bolts.—Carriage and Tire.....dis 75 %
Cast Barrel and Shutter.....dis 20&10 %
Wrought Iron Barrel.....add 10 %
" " Square.....net list

Butts.—Cast Fast Joint, Narrow.....dis 30 %
Cast Fast Joint, Broad.....dis 20 %
" Loose Joint.....dis 35 %
" " Pin, Reversible.....dis 35 %
" " Japanned.....dis 35 %
" " Silver Tipped.....dis 35 %
Wrought Narrow, Fast Joint.....dis 30 %
" Broad " ".....dis 30 %
" Loose ".....dis 30 %
" Loose Pin.....dis 30 %
" Table.....dis 30 %
" Brass.....dis 10 %
Garretson's Blind Butts, Wood.....doz sets $1 75
" " Brick.....doz sets 2 75
Parker's " Wood.....doz sets 1 85
" " Brick.....doz sets 2 75

Casters.—Iron Plate.....dis 25 %
Brass Wheel Plate.....dis 25 %
Porcelain Wheel Plate.....dis 25 %
" " Bed.....dis 25 %
Iron Wheel Bed.....dis 25 %

Chisels.—Butcher's Tanged Firmer.....dis 30 %
" Long Paring.....dis 30 %
Witherby Socket Framing.....dis 50&20 %
" " Firmer.....dis 50&20 %
" " Corner.....dis 50&20 %
" " Slicks.....dis 50&20 %

Coffee Mills.
Box 4 Iron.....$ 3 75 | Box 85 Cast Steel.....$12 00
" 103 " ..... 5 25 | Side 50..... 4 75
" 102 " ..... 6 25 | " 60..... 5 75
" 107 Britannia... 7 50 | " 70..... 7 25
" 106 " ... 8 50 | " 90..... 18 00
" 25 Union..... 10 50 | " 15 Union..... 7 00
" 35 " ..... 12 00 | " 20 " 8 00
" 75 Cast Steel.. 10 50 |

Cutlery.—American Table.....dis 20 %
" Pocket.....dis 25 %

Door Springs.—Torry.....₩ doz $5 50
Rubber..... " 4 00
Boon's..... " 5 00

Drawing Knives.—Witherby Tool Co....dis 50&20 %
Ohio Tool Co.....net list

Files.—Butcher's.....$7 00 £
Nicholson's.....$5 00 @ $5 50 £

Hammers.—
Maydole's.....net list | Yerks & Plumb.....net list
| Chener.....net list

Handles.
Extra Axe...₩ doz. $3 00 | Coal Pick, No. 1..₩ doz $2 00
No. 1 Axe.... " 2 25 | Sledge, No. 1... " 2 00
No. 2 Axe.... " 2 00 | Hatchet..... " 65
R.R. Pick, No. 1 " 2 00 | Hammer, A. E.. " 65

Hatchets.— 1 2 3
Amoskeag Shingling.....$7 25 $8 00 $8 75
" Claw..... 7 75 8 50 9 22
" Lath..... 7 50 8 25
" " Solid Steel..... 12 00

Hinges.—Strap and T.....dis 25&7½ %
Screw Hook and Strap, 6 to 12 in.....net, 9c. ₩ ℔
" " 14 to 24 in.....net, 7½c. ₩ ℔
Hook and Eye Hinges.....net 12c. @ 16c. ₩ ℔
Gate, No. 35, State.....₩ doz $3 50
" No. 3, In and Out..... " 3 50
" Blinn's Pat..... " 7 50

Horse Nails.—Northwestern, 8d.....24c
Ausable, 8d.....24c
Globe, 8d.....26c

Kettles.—Brass.....54c | Enameled.....dis 20 %
Locks and Knobs.— | EagleLock Co.....dis 15 %
Norwalk Lock Co. dis 45 % | Am. Pad Locks.....dis 35 %
Branford " . dis 45 % | Conti'al Lock Co. ..dis 10 %
Meat Cutters.— | Woodrun Patent ...net list
Haven's Patent ...net list | Stowe's Sausage
Hale's " ...dis 10 % | Stuffers.....net list
Molasses Gates.— | Enterprise Patent...dis 5 %
Stebbin's Patent ..dis 50 % |

Nails.—10d to 60d..... per keg $4 12½ @ 4 25

Oil Stones.—Washita No. 1.....net 30c ₩ ℔
Washita Slips.....net 60c "
Hindostan No. 1.....net 9c "
" Axe.....net 10c "
" Slips.....net 15c "

Picks and Mattocks.—Picks, Railroad, Axe Finish.....₩ doz $12 00
Picks, Coal, Axe Finish..... " 10 00
Mattocks, L. C., Axe Finish..... " 15 00
" S. C., " ..... " 14 50
Grub Hoes, Axe Finish, No. 2..... 1 00

Planes.—Ohio Tool Co., Bench.....dis 25 %
Sciota.....dis 30 %
A. Howland & Co., Bench.....dis 25 %
" Fancy.....dis 25 %
Bailey Patent Iron.....dis 15 %
Plane Irons, Butcher's.....dis 30 %

Rivets.—Iron..dis 10 @ 15 % | Copper, No. 7.net, ₩ ℔, 50c
Tinned.......dis 10 @ 15 % |

Rules.—Stanley Rule and Level Co.....dis 50&10 %
Hubbard & Curtiss Mfg. Co.....dis 50&10 %

Sad Irons.—Best A No. 1.....₩ ℔, 4c
" Copper Face Star.....₩ ℔, 4½c

Sandpaper.
Baeder & Adamson's No. 0 to 1½.....per ream, net $4 50
" No. 2 to 3. " net 5 00
Wiggin& Stevens, No. 0 to 1½.......₩ ream, net, $4 50
" No. 2 to 3..... " " 5 00

Sash Locks.—Champion.....₩ gross, net, $12 00
Hopkins & Dickinson.....dis 10 %
Judd's Patent.....dis 10 %
Corbin's Patent.....dis 10 %
Clark's Patent.....dis 20 %

Saws.—H. Disston & Sons.....dis 10 %
Champion X Cut.....₩ foot, net, 60c
M. A. & Co. X Cut..... " " 50c
Lightning Cut..... " " 66c

Screws.—American Screw Co.—Iron...new list dis 50 %
American Screw Co.—Brass.....dis 50 %

Shovels and Spades.
Ames' Black Shovels.....₩ doz $14 50
" Polished " ..... " 15 50
" Patent " ..... " 18 00
Alling " " ..... " 16 00
" " " Molders'..... " 18 00
Crane's Black " ..... " 11 50
" Polished " ..... " 12 00
Smith's " " B. S. L. H. Rd. Pt..... " 13 50
" " " B. S. D. H. Rd. Pt..... " 14 00
Ames' Black Spades..... " 16 00
" Polished " ..... " 17 00
" Patent " ..... " 17 50
Alling " " ..... " 16 00
Crane's Black " ..... " 12 50
" Polish'd " ..... " 13 50

Scoops.—Alling Steel Polished, No. 2.....₩ doz, $13 50
Alling Steeled Polished, No. 3..... " 14 00
" " No. 4..... " 14 50
" " No. 5..... " 15 50
" " No. 6..... " 16 50
" " No. 7..... " 17 50
" " No. 8..... " 18 50
" " No. 10..... " 21 50
Crane's Polished, No. 5..... " 13 50
" No. 6..... " 14 50
" No. 7..... " 15 50
" No. 8..... " 16 50
Crane's Black Coal, No. 4..... " 17 50
" " No. 5..... " 18 00
Preston, Black Scoops No. 1..... " 12 00
" " No. 2..... " 12 50
" " No. 3..... " 13 00
" Half Pol. Scoops No. 1..... " 12 50
" " " No. 2..... " 13 50
" " " No. 3..... " 14 50
Lippincott, Half Pol. No. 2..... " 15 00
" " No. 3..... " 16 00

Wrenches.—Taft's.....dis 60 %
Coe's Imitation.....dis 50 %
Coe's Genuine.....dis 30 %

Wringers.—Novelty Clothes Wringer.....₩ doz $69 00
Universal Clothes Wringer..... " 72 00

Chicago Metal Market.

(Reported by Cragin Bros. & Chandler, 141, 143, and 145 Lake St.)

Tin Plate.—
IC, 20x14, Coke.....$11 50 | IXXX, 14x20, " ... 22 50
IC, 10x14, Charcoal. 12 50 | IXXXX, 14x20, " ... 25 50
IX, 10x14 " . 15 50 | IX, 14x14, " ... 27 00
IC, 12x12, " . 13 00 | DC, 100 Plate, " ... 12 50
IX, 12x12, " . 16 00 | DX, " ... 15 50
IC, 14x20, " . 13 50 | DXX, " ... 18 50
IX 14x20, " . 16 50 | DXXX. " ... 21 50
IXX, 14x20, " . 19 50 |
IC, 14x20. Coke Roofing.....
IC, 10x20 Coke, for Gutters..... 19 50
IC, 14x20, Charcoal Roofing..... 12 00
IX, 14x20 " 15 00
IC, 20x28, " 25 00
IX, 20x28, " 30 00

Pig Tin.— | Small, 30 ℔..... 34c
Large, 60 ℔..... 33c | Bar Tin..... 35c

Zinc.—
In casks 1000 ℔ s..... c | In sheets..... 11 c
" 500 " ..... 10½c | Slab..... 9c

Copper.—Copper Bottoms..... 34c
Sheathing Copper..... 41c
Planished Copper..... 40c
" " cut to lengths..... 45c

Braziers' Sheets, 30x60.—6 to 8 lbs.....41 c | 15 to 100 lbs..... 33c
10 and 12 lbs..... 38c | Ingot Copper.....
Solder.—Extra Fine, C. | Bolt " 45c
B. & Co.'s Brand ..25c | Ordinary, No. 20c
Fine, No. 1..... 22c | Plumbers' Solder..... 23c
| Braz'rs' or Spelt'r Solder .35c

Antimony.....20c
Babbit Metal.....15c @ 25c.
Galvanized Iron Conductor Pipe.....₩ ℔ 10c

Sheet Iron.— Common. Smooth. Charcoal.
No. 14 to 24..... 5¼c 6¾c 8¼c
25 & 26..... 5½c 7 c 8½c
27..... 6 c 7¼c 8¾c
Add ¼c ₩ ℔ for 30 in. wide.

Galvanized Iron.....dis 15 %
No. 16 to 20.....12c | No. 27.....15c
21 to 24.....13c | 28.....16c
25 & 26.....14c |

Russia Iron.— | No. 1 Stained..... .20c
Perfect.....22c | In Sheets, 1c. higher.
American Russia.— | B.....11c
A.....15c | In sheets, 1c higher.
Lead.— | Lead Pipe, in full coils 10 c
Pig..... 8 c | Lead Pipe, when cut. 10½c
Bar..... 9½c | Sheet Lead..... 10½c

BOSTON.

(Reported by Macomber, Bigelow & Dowse, 42 to 48 Batterymarch St.)

Anvils.—Eagle, ₩ ℔ 11c. currency.....dis 15 @ 15&5 %
Augers.—Watrous Ship.....dis 10 %
Axes.—Forester's Favorite, Bronzed.....$12 50
Blue Jackets, Blue..... 12 00
Chopper's Pride, Bronzed..... 11 00
Red Cross, Red..... 10 50
Red Cross, Handled..... 13 50
Boy's Handled Blue Jackets..... 12 00
Hunts Axes.....₩ doz $15 @ 17 50 net @ 5 %
" Hatchets.....net
Shingling Nos. 1, 2, 3.....₩ doz $7 25 8 00 8 75
Claw " 1, 2, 3..... " 7 75 8 50 9 25
Lathing " 1, 2, 3..... " 7 50 8 25 9 00

Axe Handles.—Hickory, Fisher Pat. No. 1 ₩ doz $2·75
Hickory, Fisher Pattern..... " 2 " 2·00
Oak, " " ..... " 1 " 2·75
" " " ..... " 2 " 2·00
" " " ..... " 3 " 1·50

Blind Hinges.—Washburn's ....per hundred set $10 00
Blind Fasts.—Washburn's.......per hundred set $6 00
Bells.—"Connell's" Thumb Latch.....dis 50&10 %
Bolts.—Carriage. Phila. " Girard Works.....dis 50&5 %
Borax.—Best, cases and bbls.....₩ ℔ 18c
Borers.—Angle. Backus'.....dis 30 %
Boring Machines.—Angle.....each $4 75
Common. Snell's quality.....each 3 75
Braces.—Barber's.....dis 40&5 %
Backus'.....dis 50 %
Spofford's.....dis 40 %
Butts.—Union Drilled Loose Joint.....dis 60 %
" " Wire Fast Joint.....dis 50 %
" " Acorn Loose Joint...dis 50&10 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps.....dis 30 %
Wrought Narrow Butts.....dis 30 %
Cartridges.—" U. S. Cartridge Co.".....dis 50 %
Chisels.—"Buck Bros.' Shank Goods....add 20 @ 22½ %
Socket.....add 22½ @ 25 %
Compasses and Dividers.—Bemis'.....dis 35 %
P. S. & W.....dis 25 %
Cordage.—Manila (usual trade dis.).....₩ ℔, 17c
American Tarred Hemp Lath Yarn.....₩ ℔, 10c
Crow Bars.—Iron. Steel Points.....₩ ℔, 5½c
" Sweet" Steel Bars.....₩ ℔ 11c
Brown's Steel Bars.....₩ ℔ 10c
K. P. & Co. Solid C. S.....₩ ℔ 15c
Dividers.—Crook's Nickel Plated.....dis 15 %
Door Springs.—Stimson's Patent.—
No. 7, Light inside doors, $12·00.....dis 25 %
No. 8, " outside " $18·00.....dis 25 %
Torrey's.....$4·00
Drawing Knives.—Kimball Solid Steel.....7½c inch
Emery.—Wellington Mills.....₩ ℔ 16c
Alden's.....₩ ℔ 7c
Files.—Earl Smith & Co.'s English.....$5 to £ gold
American.....$5 to £ currency, less 10 %
Nicholson.....$5 to £ currency, less 10 %
Stubb's Tapers, genuine, 3 in., $1·50; 3½, $1·62; 4, $1·88; 4½, $2 13; 5, $2·50.
Funnel Irons.—$2·50 $2·50 $2·50 $3·25 per doz
5, 5½, 6, 7 inch
Deep Flange, $3·50 $3·75 $4·00 per doz
5, 5½, 6 inch
Hammers.—Maydole.....dis 5 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, ..
" " " " " " best face, No. 1, $11; 1½, $9·75.
Hangers & Rollers.—Novelty.....dis 30 %
Rider, Wooster & Co.....dis 20 %
Hatchets.—Underhill Edge Tool Co.....dis 10 %
Underhill pattern, solid, C. S. lathing.....$9 50
Underhill Bros. pattern, solid C. S. Lathing.....10 00
C. F. Dowse, warranted Cast Steel—
Shingling.....0, $4·75; 1, $5·25; 2, $5·75
Claw.....1, 5·75; 2, 6·25
Lathing.....1, 5·50
Axe Pattern.....1, $7·00; 2, 7·50
Broad....0, $5·75; 1, $6·50; 2, $7·50; 3, $9·25; 4, $10·75; 5, $12·75; 6, $14·75.
Hinges.—Strap and T, Stanley Works.....dis 25&7½ %
Plate, Loose and Fast Joint.....₩ ℔ 7½c
Wrought Screw Hook.....₩ ℔ 8c
Hoes.—Ely Balch & Co. M., B. & D.'s list, 1874...dis 25 %
Remington, M., B. & D.'s list, 1874.....dis 30 %
Lead.—Sheet and Pipe.....9c—dis 10 %
Locks.—P. & F. Corbin.....new list dis 45&5 %
Manure Forks.—
Myers & Ervien, M., B. & D.'s list, 1874.....dis 25 %
Peck, Clark & Co., " " .....dis 25 %
Shumway & Co., " " .....dis 30 %
Partridge (Original) " " .....net
4 square Tine, $12·00; 6 square Tine, $24·00.
4 oval Tine, $12·00; 5 oval Tine, $18·00; 6 oval Tine $24·00.
Mattocks.—K. P. & Co.. axe finish. long cutter..$13 75
Short cutter.....13 50
Metal.—Babbitt, No. 1, 35c; 2, 25c; 3, 16c; 4, 15c ₩ ℔
Nails.—10d and larger.....$4 25
Padlocks.—Wilcox.....dis 50&2 %
All Brass, 2¾ inch, 2 keys, job lot.....$9 00
Picks.—K. P. & Co., Polished Points—
5 to 6.....per doz $9 00; 6 to 7, $9 50
Potato Digger.—
" Partridge," 6 square tine.....₩ doz $12 00
Shumway & Co., 6 round tine.....₩ doz 9 00
Pulleys.—Clark & Co.'s Axle, 2 in.....per doz 42c
Plated Ware.—Rogers Bros.....new list dis 30 %
Plumb & Levels.—" Davis" Pat. Adjust..dis 60&10 %
" Davis" Pat. Adjustable Inclinometer, wood and iron.....dis 33⅓ %
Pocket Knives.—Conn. Cutlery Co.....new net list
Rakes.—Cast Steel, garden.....dis 30 %
Malleable.....dis 25 %
Rivets.—Black.....dis 25 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8.
13 13 14 14 15 16c ₩ ℔ net
Sad Irons.—Bless & Drake.....₩ ℔ 4½
Sand Paper—0 to 2, $4·25; 2 to 3, $4·75..new list dis 10 %
Saws.—Disston's.....dis 12½ %
Lightning X cut, Boynton's.....per foot 67c
" Saw Blades, 32 inch.....per doz $7 00
" Framed Saws.....per doz 8 50
Common " " .....per doz 6 00
Disston " " .....per doz 9 00
One man X cut.—Lightning.....$2 75 each
Disston's $3·00 each.....dis 12½ %
Saw Clamps.—Reading.....$11·25
Screws.—American Screw Co.....revised list dis 52½ %
Scythe Stones.—
" Willoughby Lake," first quality.....₩ gross $6·50
" " second quality..... " 3·00
Shovels.—O. Ames.....new list dis 12½ %
M. B. & D.....new list dis 12½ %
Sifters, Coal.—McMasters.....$12·00
Spading Forks.—M. & E.....dis 25 %
Stone Pickers.—" Partridge," original...₩ doz $15 00
Tools.—Aiken's Pattern, 20 in set; Miller's Falls, $12·00 per doz.....dis 15 %
Traps.—Oneida.....dis 20 %
Blake's.....dis 20&5 %
Trowels.—Bisbee Patent Ferrule.....net list
Vises.—K. P. & Co.'s Solid Box, Blacksmith...₩ ℔ 14½c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
" Howards." Parallel.....dis 15 %
Wardrobe Hooks.—Wire to drive.....₩ gross $1 00
Weights.—Window Weights.....₩ ℔ 2½c
Wire Netting.—Clinton Wire Cloth Co.....₩ ft 6½c
Wrenches.—Coe's Genuine Wrenches.....dis 40&5 %
Coes' Pattern.....dis 60 %
Wringers.—
Novelty and Universal } Tub No. 2 { 1 doz lots.....per doz 69 00
{ 2 doz lots.....per doz 67 00
Novelty Bench, No. 4, 1 doz lots.....per doz 101 00

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz.)

Tin Plates.—₩ box | **Lead.**— ₩ ℔
I. C. Char. 10x14 @ $12 50 | Pig..... 7¼c
I. C. Coke 10x14. 11 00 | Char. Roof. I C, 10x14 $12 00
Pig Tin.— ₩ ℔ | Coke " I C, 10x14 11 00
Banca..... 36c | Straits..... 31c
Copper.— ₩ ℔ | English..... 30c
Sheathing..... 33c | Bolt..... 35c
| Ingot..... 26c
| Sheet and Pipe..... 9c

Spelter.....₩ ℔ 9½c
Zinc.—Sheet.....₩ ℔ 10½c
Antimony..... " 16c
Iron.—Sheet Iron, Russia..... " 19c
Sheet Iron, English..... " 5½c
" " American Refined..... " 6½c
" " Galvanized..... " 11½c
Plate Iron..... "
Swedish and Norway Bar Iron, gold.....₩ ton, $135 00
" " Shapes, gold..... 142 50
Norway Nail Rods, first quality, gold..... 162 50
" " second " " 147 50
Best Refined Bar Iron..... 75 00
The " Burden Best" Iron..... 112 00
American Pig Iron, Foundry, No. 1, x..... 38 00
" " " No. 2, x..... 36 00
" " Gray Forge..... 32 00
Scotch Pig Iron.....₩ ton 44 00 @ 48 00
Wrought Scrap Iron..... 42 50

Steel.— ₩ ℔ | German..... 11 c
Eng. Tool..... 18c | Spring..... c
American Tool 15½c | Tire..... c
" Mach 11c | Sleigh Shoe..... 5½c
Bessemer..... 7½c | Toe Calk..... 8½c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Anvils.—Armitage.....₩ ℔, gold, 13c
Peter Wright's..... " 14c
Wilkinson's..... " 12½c
Apple Parers.—Conqueror.....₩ doz, $9 00
Lightning..... " 9 00
Turn Table..... " 9 00
Axes.—Hunt's.....₩ doz $13 00 @ 18 50
Lippincott's..... " 12 00 @ 13 00
Lippincott's Pioneer..... " 13 00 @ 18 50
Simmons'..... " 12 00 @ 13 00
Axles.—Kritch & Crane Mfg. Co.'s—
Patent Taper Axles.....new list net
Swelled Taper Axles.....new list net
Concord Axles.....new list net
Red Jacket Axles.....new list net
Common Axles, 1½ inch and upward.....₩ ℔, 8¼c
" " less than 1½ inch..... " 8¾c
Bellows.—" Best St. Louis make" 60c ₩ in. dis 20 %
Bells.—Troy, Church.....₩ ℔, 50c
Light Brass, Hand.....dis 50 %
Moore's, Cow.....dis 20 %
Bolts.—Arms, Bell & Co.'s Machine.....dis 20 %
Arms, Bell & Co.'s Carriage and Tire.....dis 75 %
Cast Butt Hinges.—Western Butt Co.'s—
Narrow Fast Joint.....dis 35 %
Broad Fast Joint.....dis 50 %
" Loose " .....dis 60
Reversible.....dis 45 %
" Japanned and Silver Tipped.....dis 45 %
Loose Joint " Acorn " " .....dis 55 %
Excelsior Reversible Blind.....dis 30&10 %
Lull & Porter's Blind.....dis 45 %
Wrought Butts.—Narrow.....dis 20 %
Reversible.....dis 25 %
Broad.....dis 25 %
Table Hinges.....net list
Back Flaps.....net list
Inside Blind Hinges.....net list
Chain.—Eng. Coil..3-16 ¼ 5-16 ⅜ 7-16 ½ in.
13 11 10 9¾ 9 8c gold
Trace.....6½-10-2 70c "
7-10-2 75c "
German Coil and Halter.....revised list add 10 %
Chisels.—Socket, Firmer or Framing.....dis 55 %
Clothes Wringers.—Crown.....₩ doz $60 00
Novelty..... " 72 00
Universal..... " 72 00
Monitor..... " 72 00
Corn Knives.—Dunn Edge T'ol Co.'s Clip..₩ doz $5 75
Disston's..... " 6 00
Crow Bars.—Steel Pointed.....₩ ℔ 7 @ 9c
Solid Cast Steel..... 20c
Cutlery.—J. Russell & Co.'s.....
Lamson, Goodnow & Co.'s..... } new list, dis 15 %
Landers, Frary & Clark's.....
Files and Rasps.—
Nicholson's Files.....$5 00 less 5 %
Butcher's Mill..... 6 75 to the £ currency
Heller's & Bros Horse Rasps.....dis 40 %
Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks.....dis 30 %
" " Handled Hoes.....dis 30 %
" " Planter Eye Hoes.....add 5
Winsted's Planter Eye Hoes.....add 5
Hammers.—Yerkes & Plumb.....dis 5 %
Masons' Hammers.....₩ ℔ 20c
Smith Hand Hammers..... " 22c
Handles.—Axe.....Extra. No. 1. No. 2. No. 3
$2·75 $2·25 $1·75 $1·00
Pick.....Extra. No. 1. No. 1½. No. 2.
$2·50 $2·00 $1·75 $1·25
Smith & Montross Fork, Hoe and Rake.....dis 20 %
" " Broom and Mop.....$12 @ $18 ₩ M
Harrow Teeth.—1 inch iron.....₩ ℔ 4½c
¾ and ⅞ inch iron..... " 4¾c
⅝ inch iron..... " 5 c
Barbed or Headed.....½c extra
Hatchets.—Hunt's.....dis 10 %
Simmons'.....dis 15 %
Hay Knives.—Lightning.....₩ doz $22 00
Dunn Edge Tool Co.'s.....₩ doz $14 50—dis 15 %
Fisher's..... " 16 50—dis 10 %
Hinges.—Strap and T—St. Louis make.....dis 25 %
Horse Nails.—Eureka.....23c rate
Ausable.....22c "
Northwestern.....22c "
Eagle.....19c "
National Patent Pointed.....21c "
" " " Extra Finished.....22c "
Horse Shoes.—R. I. (Perkin's pat.).....₩ keg $6 50
Burden's..... " 6 50
Mule Shoes..... " 7 50
Rhode Island Trotting Shoes..... " 9 00
Locks and Latches.—
Jones & Nimick's.....revised list dis 40 %
Moorhead, Adams & Co.....revised list dis 40 %
Norwalk Lock Co.'s.....revised list dis 40 %
Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks....₩ doz. $15 00 @ 16 00
" Grub Hoes, Oval Eye....₩ doz. 12 00 @ 13 00
Nails.—Wheeling..... $4 00 rates
Orders for 100 kegs 10c ₩ keg less.
Picks.—Klein, Logan & Co.'s R. R. and Clay ₩ doz.$12 00
Klein, Logan & Co.'s Coal..... " 9 75
" " Poll..... " 12 00
" " Stone..... " 16 50
" " Tamping..... " 19 00
Planes.—Ohio Tool Co.'s.....dis 25 %
Sciota.....dis 30 %
Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz. $27; No. 2, $30; No. 3, $32.....dis 20 %
Barton's Patent.....₩ doz $25—dis 20 %
Vaughn's " ..... " 25—dis 10 %
Sad Irons.—Monitor Brand, Silver Polished..₩ ℔ 4½c
Sash Weights.—Standard Solid Eyes.....₩ ℔ 3½c
Saws.—Disston's.....dis 10 %
Hubbard, Lippincott, B. & Co.'s.....dis 10 %
Branch, Crooks & Co.'s.....dis 15 %
Livingston's Patent Buck.....net list
Screws.—American Screw Co.'s revised list....dis 50 %
Scythes.—
Dunn Edge Tool Co.'s.....new list dis 25 %
Paris Furnace Co.'s.....dis 30 %
Scythe Stones.—No. 1 Ind'n Pond ₩ gr's, $7 00
Extra Indian Pond..... " 7 50 } dis 25 %
Premium..... " 9 50
Diamond Grit..... " 13 50
Shovels, Spades and Scoops.—
Ames'.....dis 7½ %
Lippincott's.....new list dis 15 %
Rowland's, Maxwell.....revised list dis 12½ %
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished.....₩ ℔, 17c
Solid Cast Steel..... " 35c
Striking Sledges.....₩ ℔ extra, 1c
Snaths and Cradles.....dis 25 %
Springs.—Cleveland Spring Co.'s—
Carriage and Express.....dis 20 %
Blue Seat Springs.....new list dis 15 %
Tacks.—Norway Tack Co.'s ½ weight.....dis 70 %
Brads ½ weight.....dis 50 %
Thimble Skeins.—Pump & Skein Co.'s...dis 50&10 %
Traps.—Newhouse Patent.....dis 15 %
Vises.—Solid Box.....₩ ℔ 16c
Wilson Mfg. Co.'s.....dis 15 %
Wrenches.—Coes' Genuine.....dis 33⅓ %
Coes' Pattern.....dis 50 %
Taft's.....dis 40 %

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.

Tin Plate.
IC, 10x14, Charcoal...$12 50 | IC, continuous,
IX, 10x14, " ... 15 50 | 20 in. x 200 ft.....
IC, 12x12, " ... 13 00 | IX, continuous,
IX, 12x12, " ... 16 00 | 20 in. x 200 ft.....
IC, 14x20, " ... 18 50 | IC, 10x14, best Coke...$11 50
IX, 14x20, " ... 16 50 | IC, 10x14, good " .. 11 00
IC, 14x20, Terne..... 12 00 | IC, 10x20..... 19 00
IX, 14x20, " ..... 14 50 | IC, 14x20..... 11 50
IC, 20x28, " ..... 25 00 | IC, 14x20, Coke Lead. 9 50
IX 20x28. Terne..... 30 00 | IC, 10x14, punch'd for Safes..... 10 00

Block Tin.
Large Pigs.....30c | Bars.....32c
Small " .....31c |

Sheet Zinc.
Casks.....₩ ℔ 10 c | Sheet.....₩ ℔ 11c

Solder.
No. 1, Refined, in bars or plate.....20c
No. 2, " " 18c
Pig Lead.....7½c

Sheet Copper.—18 to 100 lbs. Sheets 30x60.....00c
14 to 16 lbs., Sheets 30x60.....35c
10 to 12 lbs., " and 30x72.....38c
6 to 9 lbs., " 41c
Tinned, 14 and 16 oz. 14x48.....44c
Planished, 14 and 16 oz. 14x48.....41c
" No. 7, 8 and 9.....48c
Copper Bottoms.....35c

Sheet Iron.— Comm'n Sm'th. Char'l. Juniata.
No. 16 to 20..... 5c 6c 8c 10c
No. 22 to 24..... 5c 6c 8c 10c
No. 26..... 5½c 6½c 8½c 10½c
No. 27..... 5½c 6½c 8½c 10½c

Galvanized Iron.....dis 15 %
Iron Rivets.....dis 30 %
Iron Wire.....dis 30 %
Copper'd Market Wire.....dis 25 %
Copper Rivets and Burs.....dis 10 %
Russia Iron.—Nos. 9, 10, 11 and 12, ₩ ℔.....20c
No. 1, stained, ₩ ℔.....20c
Imitation Russia, ₩ ℔.....15c

Woodruff Iron Works,

HARTFORD, CONN.,

Office, - - - - - - No. 223 State Street.

Manufacturers of the Celebrated

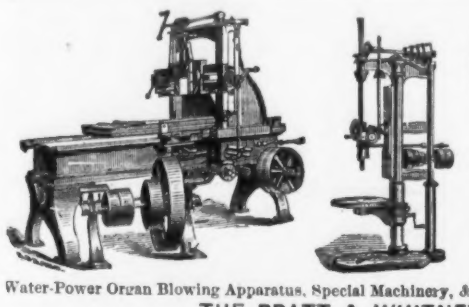
WOODRUFF & BEACH STEAM ENGINE,

With Recent Improvements.

STEAM BOILERS

Constantly on hand, and made to order—of any size or style. Special attention given to all kinds of

MILL MACHINERY & CASTINGS.



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Of excellent designs and workmanship, complete, with best modern attachments. Gun and Sewing Machine Machinery and Fixtures in great variety, Friction Clutch Pulleys,

Water-Power Organ Blowing Apparatus, Special Machinery, &c., made by

THE PRATT & WHITNEY COMPANY Hartford, Conn.

RICHARD DUDGEON,

No. 24 Columbia Street, New York,

MAKER AND PATENTEE OF

Hydraulic Jacks and Punches,

ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

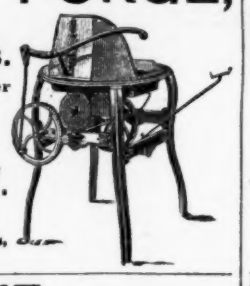
JACKS for Pressing on Car Wheels or CRANK PINS made to order.

The "EMPIRE," a Fan Blowing

PORTABLE FORGE,

(Patent Applied for.)

Without BELTS or BELLOWS.



It is more **Easily Worked,** gives a **Better Blast,** and is the **Cheapest** forge made, and

☞ It has no Back Draught.

W. P. KELLOGG & Co., Troy, N. Y.

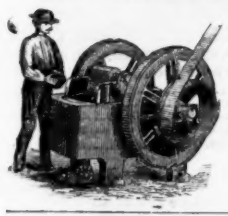
And 84 Chambers St., N. Y.

Also **Curry Combs, Boring Machines,** and **Cooler's Whip Racks, etc, etc.**

BLAKE'S PATENT

STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds o hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

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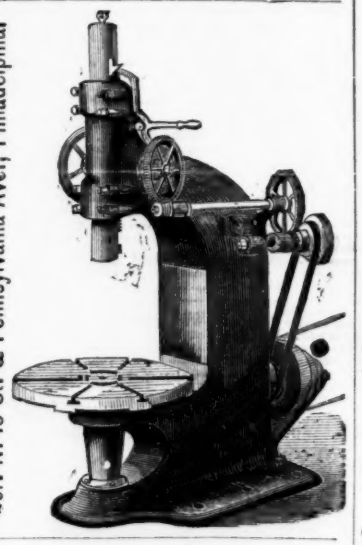
Persons visiting New York, can be shown a crusher in operation at 137 Elm St



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Manufacturer of **ENGINE LATHES,** from twelve (12) to forty-eight (48) inches swing; **Hand Lathes; Wood Turning Lathes; Vertical Drills; Boring Mills; Tapping and Centering Machines; Screw Press** for Mandrels; **Grindstone Boxes.**

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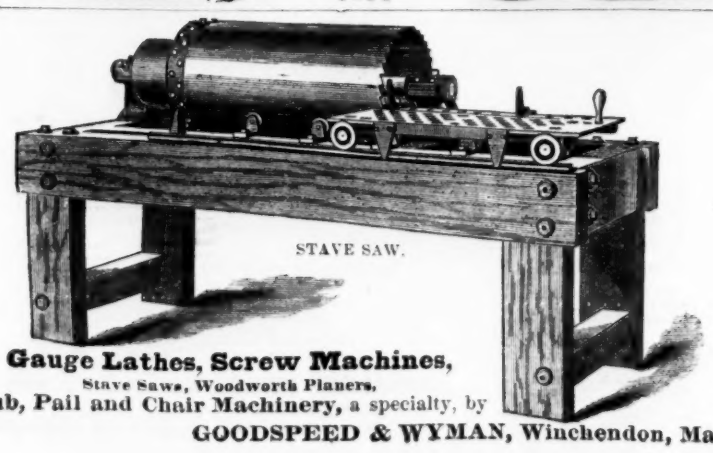

STAVE SAW.

Gauge Lathes, Screw Machines,

Stave Saws, Woodworth Planers,

Tub, Pail and Chair Machinery, a specialty, by

GOODSPEED & WYMAN, Winchendon, Mass,

GUILD & GARRISON'S

STEAM PUMP WORKS,

Nos. 30 to 34 First Street, Williamsburgh, N. Y

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STEAM PUMPING MACHINERY

Of all descriptions and for all purposes, of any proportion or size, for pumping Hot, Cold, Fresh, Salt, Muddy or Gritty Water, Grain-mash, Syrups all kinds of Beer, Acids, Molasses, and all heavy and thick fluids. Also for Feeding Steam Boilers, Supplying Tanks, and for Sugar Refineries, Tanneries, Oil Refineries, Gas Works, Hotels, Breweries, and for all classes of manufactories: for Draining Mines and Excavations, and for Rolling Mills, Blast Furnaces and Water Works supplying Cities, Towns and Villiages with Water; also, for Wrecking purposes and Steam Fire Engines for Land and Sea.

Also, Manufacturers of Vacuum Pumps, Duplex and Single, and Copper or Iron Vacuum Pans of all sizes and for all purposes, with complete fixtures for Refining Sugar, Corn Syrup, Glue, &c., or for condensing Milk, Extracts, Chemicals, &c., &c.

All Work from this Establishment fully Warranted.

Catalogues mailed on application.

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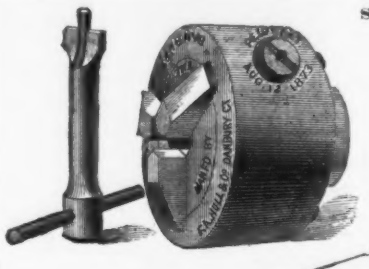

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Not equalled in any essential. Only Chuck holding drills from ⅝ down to 0. Runs *true* on all sizes, and will never slip or "set."

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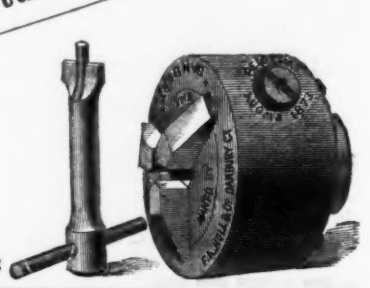

C. H. Reid's Patent, Aug. 12th, 1873

SELDEN PATENT

DIRECT ACTION STEAM PUMP,

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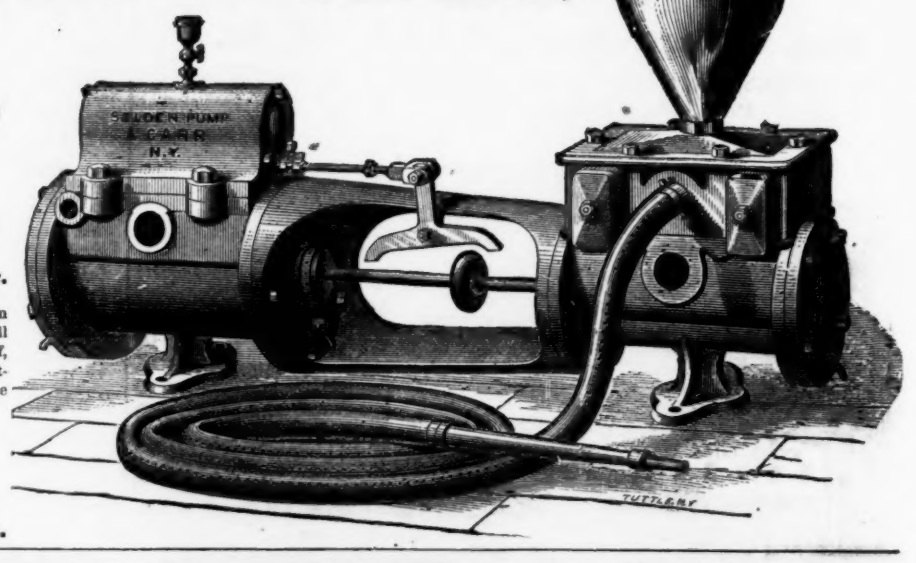
Tank Pump, with Boiler Feed Attachment.

For Boiler Feeders,
For Water Works,
For Fire Pumps,
For Mines, etc., etc.



And for all purposes for which Steam Pumps can be used. Sold under full guarantee. Money will be returned if, from any cause, they should prove unsatisfactory. Send for Circular and Price List, fully describing them, to

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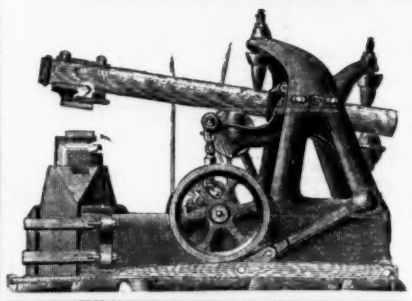
BRADLEY'S CUSHIONED HAMMER.



This Hammer has many valuable improvements made useful in the device for cushioning the blow, thereby relieving all the working parts from that jar and concussion which is the destroying element of other Helve Hammers. It is made Adjustable in Line of Action, Length of Stroke, Rapidity of Motion, and Weight of Blow, all of which are controlled at the will of the operator. They have ***Larger Capacity, Cost Less,*** are more ***Durable,*** take up ***Less Room,*** do ***More*** and ***Better Work*** at ***Less Expense*** for Power than any other Hammer in use. We guarantee them fully as recommended. For particulars, address

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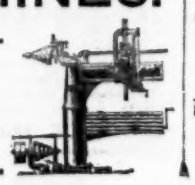

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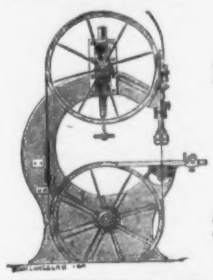

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Shapley Engine
COMPACT,
PRACTICAL,
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$200·00.

Cheaper than any Engine offered of the same capacity.

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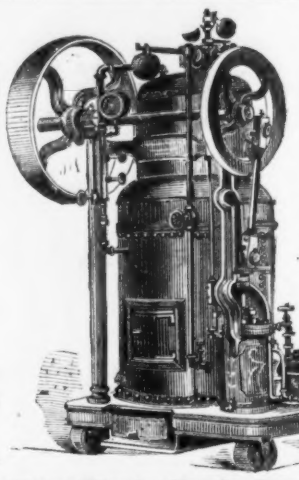

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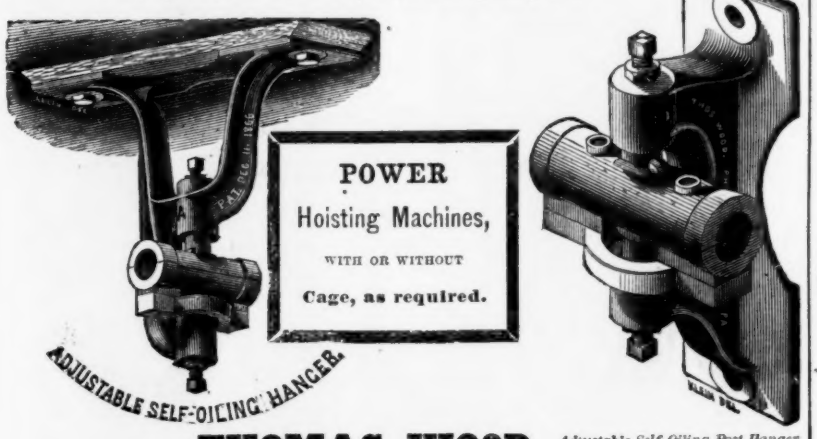
Office, 2106 Wood St., Philadelphia, Pa.



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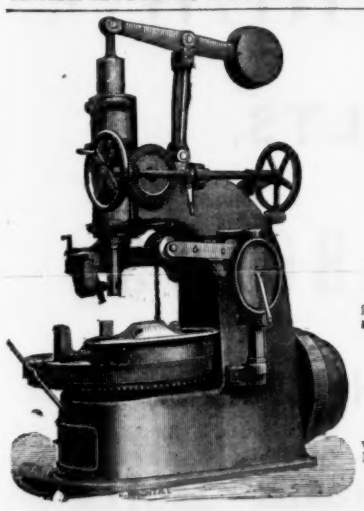
POWER LOOMS, with (new) Patent Box Motion. **SPOOLING, BEAMING, DYEING and SIZING MACHINES.**
BOBBIN WINDING MACHINES—wind direct from hank or skein to shuttle bobbin.
SHAFTING, with Patent Adjustable Self-Oiling Bearings.
PLANS taken, and **FACTORIES** fitted out complete with **Shafting and Gearing.**
PULLEYS, from 4 inch to 10 feet diameter, of most Approved Pattern.
SELF-ACTING WOOL SCOURING MACHINES, (Yewdall's Patent.)
Machine and Foundry Work in all their branches. Send for Price List of Pulleys & Shafting.



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MANUFACTURERS OF
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OF ALL DESCRIPTIONS.
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We have the best and most complete assortment of

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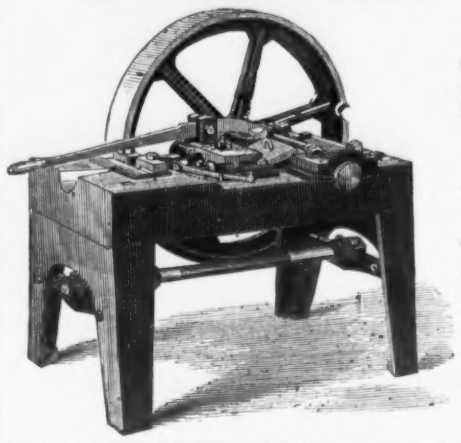

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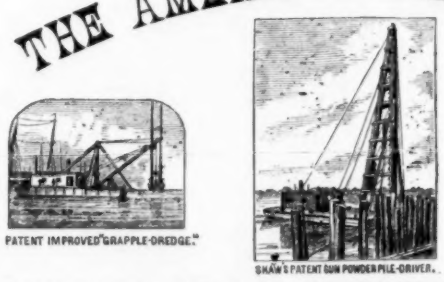

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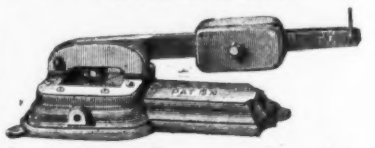

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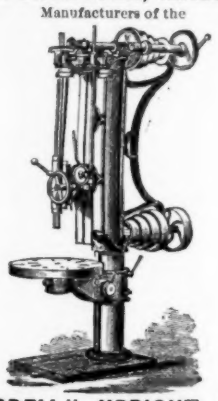

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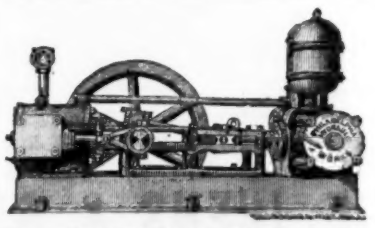

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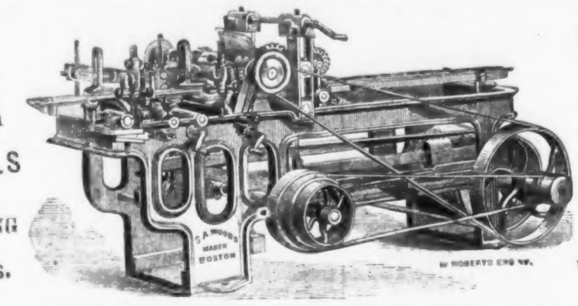

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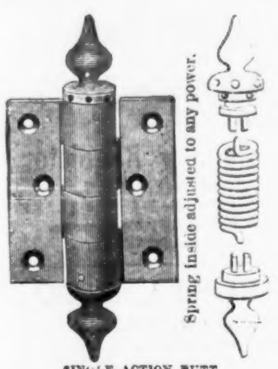

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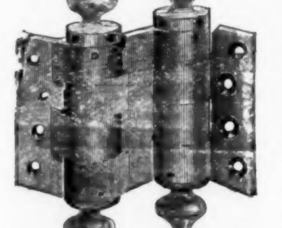

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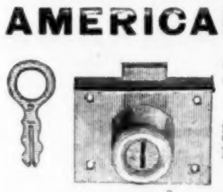

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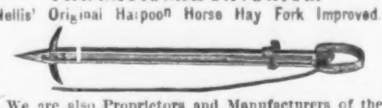

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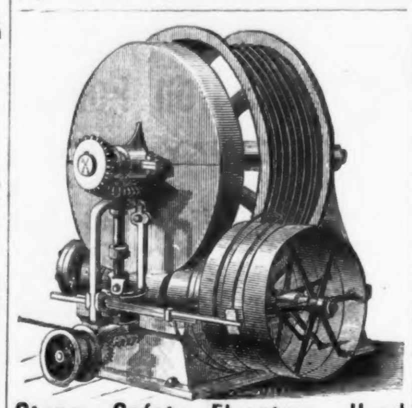

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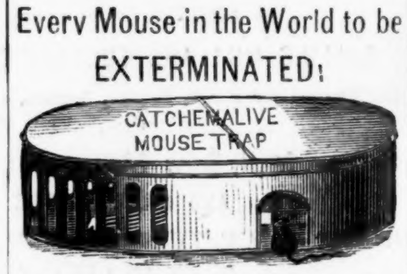

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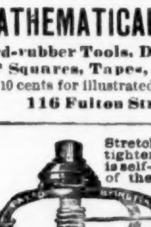

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